Version 01-2021

www.clean-impianti.it

ANOPC
TECHNIP ENERGIES

PROJ.: ASSIUT HYDROCRACKING COMPLEX
OWNER: ASSIUT NATIONAL OIL PROCESSING COMPANY(ANOPC)

MATERIAL REQUISITION No.
079254C MR 4190-003

ITEM: 55-Z-001

SR Doc. CODE: A5015-A5016

PURCHASE ORDER N.: 079254A0166

TECHNIP ENERGIES | VENDOR DOCUMENT REVIEW

☐ 1 REVISE AND RESUBMIT
☐ 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
☒ 3 NO COMMENT – FINAL ISSUE
☐ 4 FOR INFORMATION ONLY

jfazioli - Jun 05, 2023

clean®
Impianti e Tecnologie

VIETATO L'ACCESSO
clean
450

A5015-A5016
USER MANUAL
Wheel Washing System

1	25/05/2023	Second Emission	M.A.
0	08/03/2023	First Emission	M.A.
Rev	**Date**	**Description**	**Issued by**

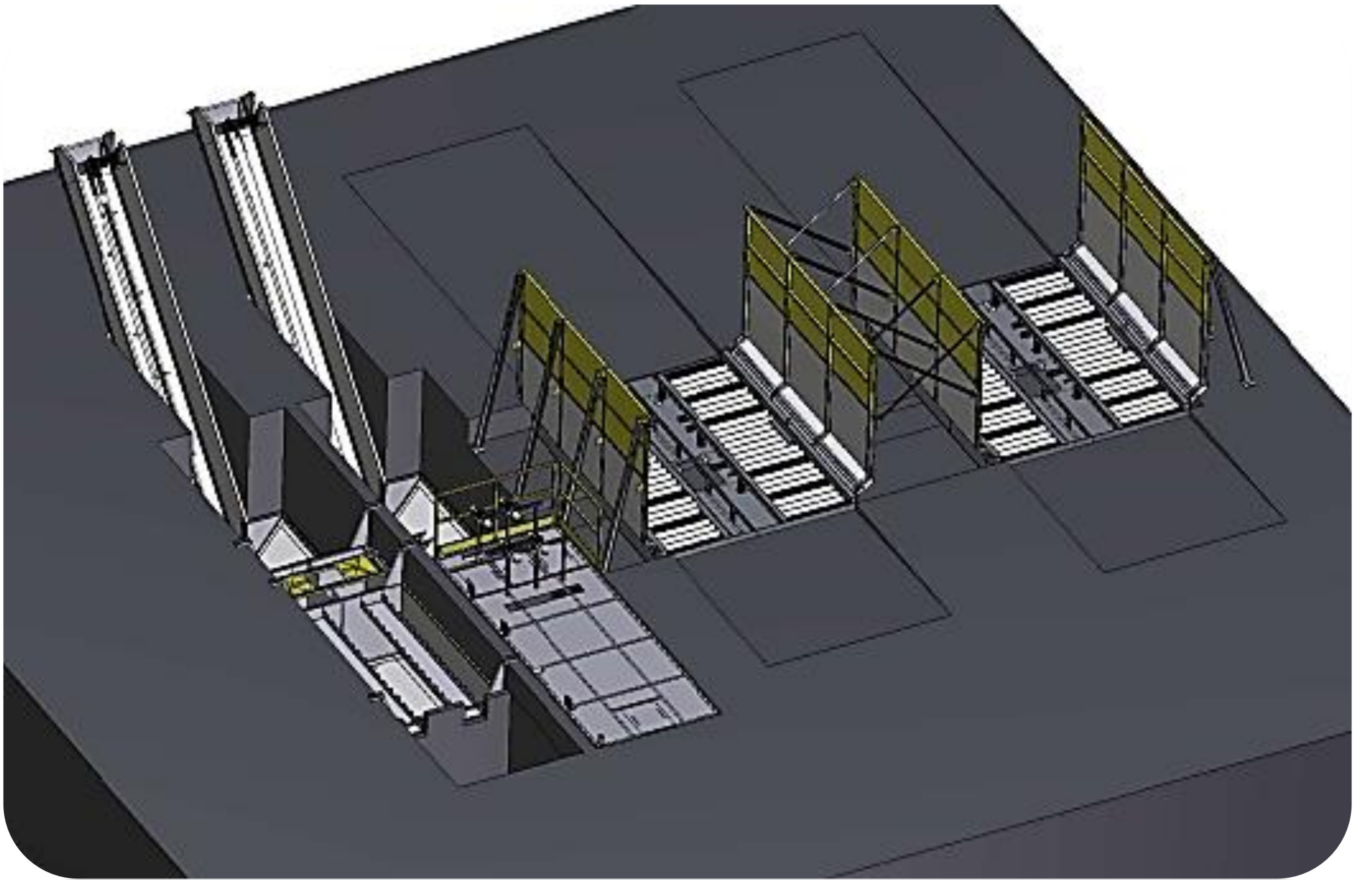
Assistenza Clienti dall'Italia
Customer Support from Italy
☎ +39.049.9300.500

clean
Automated wheel wash & Disinfecting

watch our systems in action on YouTube channel: **CLEAN IMPIANTI**

Congratulation, we are glad for your choice. You bought a very reliable system. This product is manufactured by **Clean® S.r.l.**, which has been working to aim with perseverance to the quality for decades. You are now owner of a system to whose realization, we worked with zeal and seriousness; we are conscious that quality doesn't rise from pure chance but, on the contrary, from a careful and scrupulous check of materials used for the realization. Thank you for the choice done.

Clean® S.r.l.



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SERIAL NUMBER

CLEAN S.r.l.
Via Borgo Padova, 64 Camposampiero (PD) ITALY
Phone +39 049 9300500 - Fax +39 049 9320042
www.clean-impianti.it clean@clean-impianti..it

Model:	**2X400.VTCF30 (TAYLORED)**	**kW:**	**40**
Serial Number:	**PF -----**	**V:**	**400**
Year:	**2023**	**A:**	**77**
Order:	**C 802/22**	**Hz:**	**50**
Pressure:	**1÷3 bar**	**Electrical supply:**	**3P+N/PE**
Total Water Flow:	**6.000 lt/min.**	**Reference standard:**	**2006/42/CE**

CE

The serial number with all the technical data of the system can be found on the plate located on the main control panel of the system.

CE Dichiarazione di Conformità

Declaration de Conformite • Declaration of Conformity • Dichiarazione di Conformità

"Directive **2006/42/CE** of 17 May 2006 and Conformity according to Annex III, affixing CE Mark"

Customer	**ASSIUT NATIONAL OIL PROCESSING COMPANY (ANOPC)** ANOPC ASSIUT NATIONAL OIL PROCESSING COMPANY شركة أسيوط الوطنية لتصنيع البترول
Worksite	Assiut Hydrocracking Complex – ANOPC (Egypt)
Serial Number	PF 5987
Type of model	Taylored Wheel Washing System 2x400C.VTCF30 – Inground Concrete tank
Year of construction	2023

The company **CLEAN S.r.l.**, with registered office in **Borgo Padova, 64 - 35012 Camposampiero (PD) ITALY**, in the person of **Mr. Prosdocimi Luigino**, as the **OWNER** and the person designated to the drafting of the technical dossier, under his responsibility,

ACKNOWLEDGES

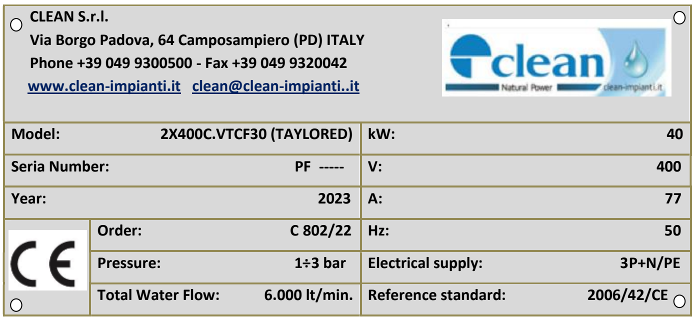
that **Wheel Washing system** related to the order reported below complies with the requirements of the risk analysis assessment carried out by the customer and therefore complies with the essential requirements of "2006/42/CE MACHINERY DIRECTIVE"

Plant description: **TAYLORED WHEEL WASHING SYSTEM 2X400C.VTCF30 – INGROUND CONCRETE TANK**

DECLARES

That the plant: **WHEEL WASHING SYSTEM**
with serial number n°: **PF 5987**
and electrical panel:

Model	**TAYLORED 2X400C**
Order	**C 822/22**
Electrical supply	**400V 3P+N+PE 50Hz**
Nominal Power	**40 kW**
Degree of protection	**IP 55**
Year	**2023**



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Phone +39 049 9300500 - Fax +39 049 9320042
www.clean-impianti.it clean@clean-impianti..it

Model:	**2X400C.VTCF30 (TAYLORED)**	**kW:**	**40**
Seria Number:	**PF -----**	**V:**	**400**
Year:	**2023**	**A:**	**77**
Order:	**C 802/22**	**Hz:**	**50**
Pressure:	**1÷3 bar**	**Electrical supply:**	**3P+N/PE**
Total Water Flow:	**6.000 lt/min.**	**Reference standard:**	**2006/42/CE**

If installed and stored in accordance with its intended use, the legislation and rules in force, the instructions of the manufacturer attached and workmanlike, and if subjected to regular and periodic maintenance and functional checks.

It is in accordance with European directives' provisions:

Directive: **2006/42/CE, MACHINERY DIRECTIVE**;
Description: *To harmonise the health and safety requirements applicable to machinery on the basic of a high level of health and safety protection, transposed and implemented by the Legislative decree 27th January 2010, no. 17 publication of 19-2-2010.*
Ordinary supplement no. 36/L to GAZZETTA UFFICIALE General series – no. 41

Directive: **2014/30/UE, LOW VOLTAGE DIRECTIVE (LVD)**
Description: *Safety requirements and procedures for assessing the conformity of Low Voltage electrical equipment (Transposed in Italy by the Legislative decree no. 86 of 19/05/2016).*

Directive: **2014/35/CE, ELECTROMAGNETIC COMPATIBILITY DIRECTIVE (EMC)**;
Description: *Protection requirements regarding electromagnetic compatibility and procedures for assessing compliance (Transposed in Italy by Legislative decree no. 80 of 18/05/2016).*

It is in accordance with following harmonise standards:

Standard: **CEI - EN 60204-1 (CEI 44-5), SAFETY OF MACHINERY – ELECTRICAL EQUIPMENT OF MACHINES (2006);**
Description: *Part 1: General requirements;*

Standard: **CEI - EN 61439-1 (CEI 17-13/1), SWITCHBOARD BT (2014)**;
Description: *Low Voltage switchgear and control gear assemblies, Part 1: Type-tested series equipment (AS) and type-tested not series equipment (ANS);*

Standard: **CEI EN 61000-6-1/2 (CEI 210-64, CEI 210-54), ELECTROMAGNETIC COMPATIBILITY (EMC), IMMUNITY (2012)**;
Description: *General immunity standard, Part 1: residential, commercial and light industry environments, Part 2: industrial environments;*

Standard: **CEI EN 61000-3/4, CEI 210-65, CEI 210-66, ELECTROMAGNETIC COMPATIBILITY (EMC), ISSUED (2012)**;
Description: *General issue standard, Part 3: residential, commercial and light industry environments, Part 4: industrial environments;*

Standard: **CEI EN 12100, SAFETY OF MACHINERY (2010)**;
Description: *General design principles, risk assessment and risk reduction*

Note: The equipment may not be used for purposes other than those indicate on "Description and use of the panel"

CE ***Year of marking* 2023 --** Date: 02nd August 2021 -- Camposampiero (PD)

The legal representative of the company

Prosdocimi Luigino

clean s.r.l. società unipersonale
ia Borgo Padova 64 – Tel. 049.9300500 r.a.
012 CAMPOSAMPIERO (Padova) - Fax 049.9320042
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pitale sociale Euro 100.000,00 int. vers
INTERNET www.clean-impianti.it
e-mail: clean@clean-impianti.it

GUARANTEE CERTIFICATE

Clean Srl release a warranty of **24 months on the system.**
The warranty begins from the STURT-UP date and covers the substitution or the reparation of all materials which come out defective because of constructive faults or ones regarding the building materials, previous our unquestionable check.

The damages founded on the components, which are caused from their natural deterioration, are not covered by the warranty.

The parts made of rubber and the electric parts of the plant are always excluded from the warranty.
Excluded are damages or defects in failure to scheduled maintenance described in this manual, neglect, use of the system not in accordance with the instructions and the use of products or components not certified and approved by us in writing.

Tampering or repairs by the customer or by persons not authorized by us or modifications to the interventions of any kind not authorized by us during the warranty period and in any case the replacement of components that are installed by the staff not clean, do not qualify under any circumstances guarantee and no refund of any general costs and replacements do not agree.

It is obligatory to carry out the maintenance of the system every three months from the day of delivery of the system, must be performed by the technical Clean S.r.l.'s staff, if this is not requested and executed accordingly the guarantee is considered invalid. The warranty does not cover labour costs and call transfer and shipping of materials, which are to be paid by the customer. In addition, the warranty is void in the presence of unsolved (happened and present), missed payments in general and non-compliance with agreements that occurred during the purchase of the property for any reason.

Our technician, during servicing, apply the price lists in his possession, **(official price list Clean**), he counts and after the approval by the customer and bank transfer costs to be incurred (maintenance, replacement, performance etc ...) he performs the services required for our expertise; then our office emits and sends regular invoice.

The prices invoiced are the list plus VAT (if due); labour, including travel time there and back from the Clean Srl to the building site and the opposite, it is counted in Euro 80,00 / hour per technician Clean, while the cost of the trip for programmed invoiced 1.50 Euro / km and 3.00 Euro / km for work on request emergency.
All ordinary and extraordinary requirements, such as the delivery of spare parts and components, will be carried out by Bank Transfer Advance.
We are at your disposal to offer the best support and cooperation. On this occasion, we send best regards.

Camposampiero (PD), 02nd August 2021

The legal representative of the company

Prosdocimi Luigino

clean s.r.l. società unipersonale
ia Borgo Padova 64 – Tel. 049.9300500 r.a.
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Introduction

The purpose of this guide

The purpose of this guide is to provide you with the help in every situation regarding both the use and the general maintenance of the same.

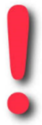
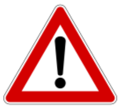
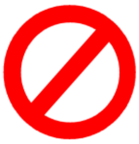
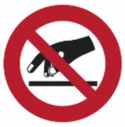
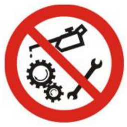
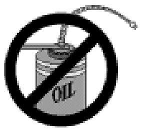
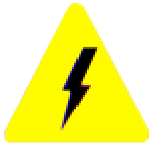
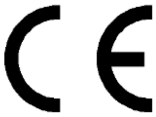
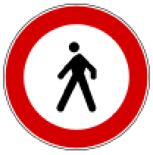
Below is given a brief explanation of the various chapters in the manual.

The chapters are the following:

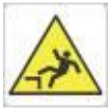
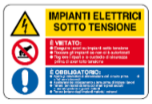
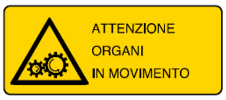
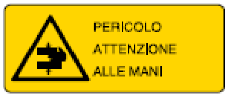
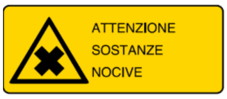
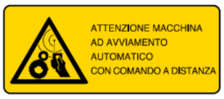
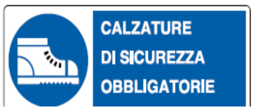
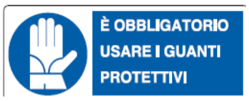
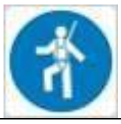
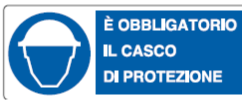
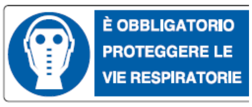
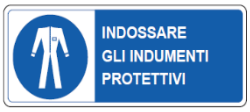
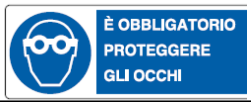
1. **Chapter 1: "Safety".** The chapter contains all the information about security, including the general warnings.
2. **Chapter 2: "The Plant".** The chapter provides details of the equipment, describing its composition and functioning. Will also indicate the operation to be conducted to make the plant operational.
3. **Chapter 3: "Efficient Use**". The chapter contains the information necessary for the proper use of the installation and maintenance.
4. **Chapter 4: "Emergency**". The chapter offers quick tips for solving problems that may occur.
5. **Chapter 5: "Technical Data**". Here are presented all the technical data including drawings of the forms.

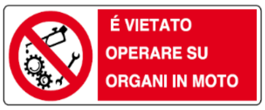
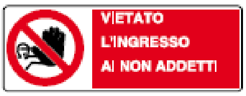
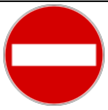
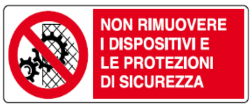
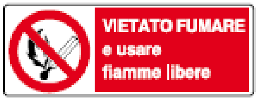
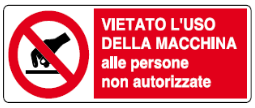
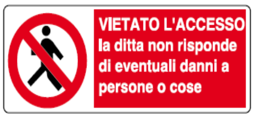
Symbols used in the manual

Here after main symbols used in the manual with the explanation of their meaning.

	"**ATTENTION**" When you find this symbol, you have to pay particular attention to what is described in the mentioned paragraph. The non-respect of the rules, could involve damages to the machine or the non-respect of the effective laws
	"**DANGER**" When you find this symbol, **it is obligatory** to respect the indications described in the mentioned paragraph. The non-respect of the rules, could involve damages to things or persons.
	"**FORBIDDEN**" When you find this symbol, **it is obligatory** to respect the indications described in the mentioned paragraph. The non-respect of the rules, means the non-respect of effective laws and disposition. Then it indicates acts to avoid absolutely, which could involve damages to things or persons.
 	"**MAINTENACE FORBIDDEN**" When you find this symbol, you have to respect the indications described in the mentioned paragraph, it is forbidden to execute or to make execute maintenance from non-qualified personnel. The non-respect of the rules, means the non-respect of effective laws and disposition. Then it indicates acts to avoid absolutely, which could involve damages to things or persons.
	**Respect the environment:** **Dispose of oils and hydrocarbons through authorized companies.**
	"**RISK OF ELECTROCUTION**" This symbol reminds to pay attention to all risks of electric nature.
	"**CERTIFICATION OF COMPLIANCE".** This symbol certifies the machine to the harmonization of construction safety equipment with current European regulations.
	**Prohibited for walkers.**

Read the meaning of safety signs:

DANGER SIGNALS		**Danger of falling** inside the tank which can produce, by a slipping or collision, along the entire perimeter of the tank itself.
	 IMPIANTI ELETTRICI SOTTO TENSIONE È VIETATO: È OBBLIGATORIO:	**Danger of electric shock:** device on. **Do not touch** live parts
	 ATTENZIONE ORGANI IN MOVIMENTO	**Danger** of moving parts.
	 PERICOLO ATTENZIONE ALLE MANI	**Danger gear:** attention to the hands.
	 ATTENZIONE SOSTANZE NOCIVE	**Danger:** the presence of harmful substances.
	 ATTENZIONE MACCHINA AD AVVIAMENTO AUTOMATICO CON COMANDO A DISTANZA	**Danger:** machinery to start automatic remote control.
SIGNS OF OBLIGATION	 CALZATURE DI SICUREZZA OBBLIGATORIE	**You must** wear safety shoes: non-slip and anti-perforation reinforced toe.
	 È OBBLIGATORIO USARE I GUANTI PROTETTIVI	**You must** wear cut resistant gloves
		**You must** wear a harness if to reach the table top of the machine, it is necessary to cover an area not protected by railings but suitably equipped for anchoring.
	 È OBBLIGATORIO IL CASCO DI PROTEZIONE	**You must** to wear a helmet.
	 È OBBLIGATORIO PROTEGGERE LE VIE RESPIRATORIE	**You must** to protect the respiratory tract
	 INDOSSARE GLI INDUMENTI PROTETTIVI	**You must** wear protective clothing
	 È OBBLIGATORIO PROTEGGERE GLI OCCHI	**You must** to protect your eyes with goggles
		You must wear high-visibility clothing.

PROHIBITION SIGNS	 É VIETATO OPERARE SU ORGANI IN MOTO	**It is forbidden** to approach any maintenance with the machine in operation.
	 VIETATO L'INGRESSO AI NON ADDETTI	**It is forbidden** to bring the machine to all the people responsible for using the machine.
		**No entry:** prohibits entering a road accessible instead in another sense**.**
	 NON RIMUOVERE I DISPOSITIVI E LE PROTEZIONI DI SICUREZZA	**It is forbidden** to remove or modify the machine guards
	 VIETATO FUMARE e usare fiamme libere	**It is forbidden** to approach the machine with cigarettes and open flames.
	 VIETATO L'USO DELLA MACCHINA alle persone non autorizzate	**It is forbidden** The use of the machine by unauthorized personnel.
	 VIETATO L'ACCESSO la ditta non risponde di eventuali danni a persone o cose	**No entry**: the company is not liable for any damage to persons or property.

1.Safety

1.1. General warnings

This “Operating Manual” constitutes integral part of the plant. It is an essential component for its working and it is furnished together with the plant.

From now on, it will be called only “Manual”

The use of the plant involves the total knowledge of the cautions, of the indications and of the safety dispositions, the same thing counts for its the maintenance.

Keep with care the Manual for every further consultation.

The installation must be conducted by professionally skilled personnel, according to the instructions, which are furnished from the builder and observing the dispositions of law in matter.

A wrong installation could cause damages at persons, animals and/or objects; in this case the Manufacturer is consequently not responsible.

This manual is intended to give the correct information for proper use and maintenance of the system so that you prevent any accidents caused by improper use.

Then the execution of the operations of repair and maintenance requires prior knowledge of all safety regulations.

It is obligatory to contact only personnel with specific experience of the equipment.

1.2. Behaviour rules

The user has always to prefer his security and safety, as well as the ones of the other persons who could be involved by his actions, to any other own valuation or interest; his behaviour has to be responsible and judicious. The operation area, which is interested by the action range of the high-pressure jet, has to be absolutely free and forbidden to the objects that could be unintentionally damaged by the water pressure. **If necessary, adjust bulkheads should be provided by the operator in protection than it could be accidentally exposed to the jet.** The plant is a machine with tested safety if it is used for the purpose to which it has been built.

The customer is obliged:

a) To give the possibility to use the plant only to the personnel skilled from the technicians of the builder, which have read the present Booklet, that have the knowledge of the operating modalities and of the possible dangers due to the proper and improper use of the plant.

b) To respect the indications of the booklet and the general accident prevention rules.

c) To canalise the leak out water into special cisterns and to purify it before digesting, respecting the laws against the pollution.

d) To keep hold under control the operation of the machine during the utilisation.

e) To make execute the maintenance only from professionally skilled personnel.

f) To execute maintenance only with cold water and ONLYAFTER HAVING DISCONNECTED THE PLANT from the electric and pneumatic network proceeding on the SORTER.

g) To remember that the Booklet is integral part of the plant; in event of SALE, CESSION or HIRE of the plant the customer has to make sure that the Booklet always accompanied it, so that it could be consulted from the new user avoiding dangerous situations.

To use ONLY components and fittings furnished from the maker.
The utilization of other kinds of fittings or spare parts, involves the decay of the conformity of the machine to the Machine's Directive nr.89/392 CEE and successive modifications. If the customer didn't use original components and fittings, the safety standards would be compromised; in this case the Manifacturer would be exonerated from any.

1.3. Safety for the user

The manufacturer please kindly the user or users to carefully read the rules on the safety of persons utilizing the facility that are written below.

The plant can only be used for washing surfaces such as: the wheels, the sides of the vehicles, underbody.

The necessary attention not to cause damage during use is left solely to the operator. The system is only intended for washing wheels through more jets of water at low pressure, possibly combined with sanitizing or cleaning fluids.

Any other use of the machine is considered dangerous.

In addition, the **Clean S.r.l.** recommends **the following precautions during use:**

1. Be careful to the risks arising from electrical faults;
2. Keep on hand a first-aid kit and a fire extinguisher.

The Manufacturer declines all responsibility for damage caused by operating errors and failure to follow instructions

NOTE:

- **coming out of the wheel washing systems check / verify the functionality of the brake system and all electrical and hydraulic of all vehicles to avoid accidents and damage to persons and property;**

- **Our clean society srl disclaims any responsibility for any direct and indirect damage caused to both vehicles passing through the wheel wash both damage to third parties, things and people**

1.4. Procedure for correct use of the washing lane

To be able to proceed to the washing cycle, the driver must approach slowly to proximity sensors placed at the entrance of the washing track (if manual activation is installed it will be necessary push the button); at this point the operator must wait for the complete pressurization of the washing system before proceeding with the advancement of the vehicle inside of the washing lane.

Before entering the washing lane is recommended to completely close:

1. The doors of the vehicle to wash;
2. Front, side and rear windows of the vehicle to wash;

The maximum speed allowed in the washing track is:

V max = 3 km/h

This speed may not absolutely never be exceeded, also, if necessary, the vehicles will have to make short stops inside the wheel washing systems to allow the washing nozzles to remove the sediments deposited on the tires.

1.5. Security of the environment

Clean S.r.l. is actively engaged to the environment and pollution prevention. In this regard, it has compiled this section where you will find signs for compliance with current regulations for environmental protection.

You must only use chemicals that:

1. comply with the requirements required by accident prevention L.81/2008;
2. buffered solution (constant pH level);
3. specific to the type of dirt and the surfaces to be cleaned.

All products must be biodegradable.

The packing materials must be disposed of using the provided canals for the disposal of waste and container to separate collection.

All waste materials resulting from maintenance work must be properly disposed. **Avoid that pump's oil or any other waste generates from the use of complete system will be lost in the environment.**

ATTENTION

The laws currently in force related to the oil exhausted, requiring disposal through company authorized to collect the oil.

Check those polluting substances due to residues of the wash do not go to disperse in the environment channelling inside special tanks for the subsequent purification treatment.

In case of non-compliance with these instructions, the manufacturer disclaims any responsibility.

2. The system

2.1. Definition and Purpose

The washing plant is designed and built for washing the wheels, side and bottom of the means. This type of plant is equipped with three adjustable pressure centrifugal pumps that feed the submerged structure. The waste water flow out later in the tank of sand extraction.

The plant allows a good:

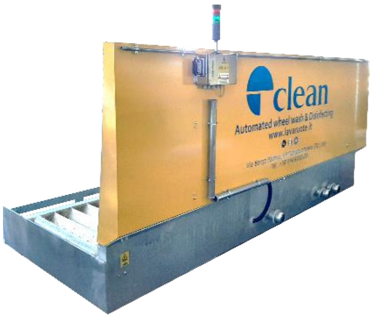
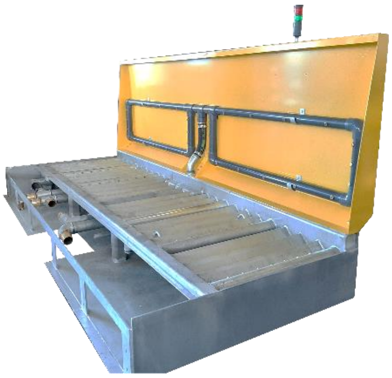
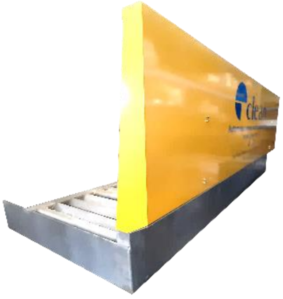
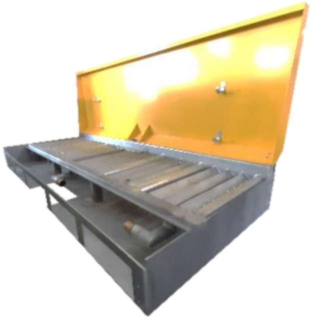
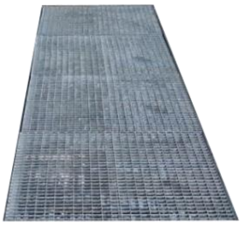
- ☐ **WASHING** Removing dirt deposited on the wheels, side and bottom of the trucks.

NOTE: our thirty years' experience has shown that the products we offer have never caused any problems of pollution or damage to third parties. We believe they are therefore suitable for standard use in our systems for all of our customers who use the plants mod. clean®.

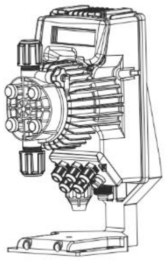
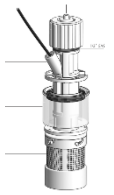
Clean S.r.l. declines all responsibility if the system is not used according to the purposes described above.

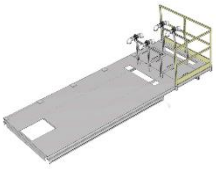
2.2. System's components

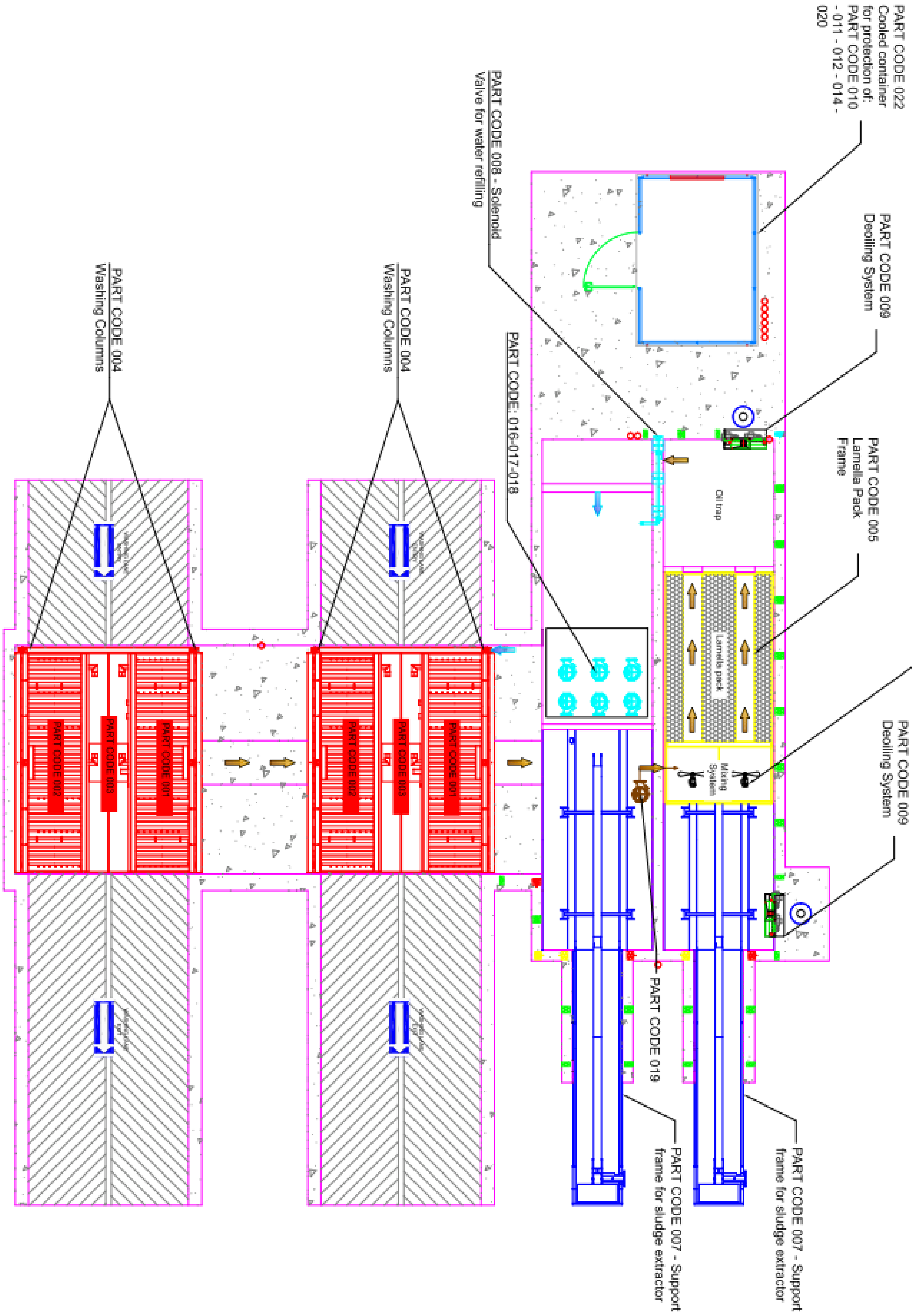
The main system's parts are summarized in the table below (pictures can be different from the reality).

Part code	Component's Name	Function – Technical Data	Q.ty	Pictures
001	**1st half** of the washing lane's steel frame (the one with hydraulic connections)	Its function is to wash the truck, collect water, debris and sludge before to pump them to the clarification tank. • Length ≈ 4.000 mm • Inside width ≈ 1.450 mm • External width ≈ 1.685 mm • Height ≈ 355 mm (1.650 mm with anti-splash side walls); • Weight ≈ 1.600 Kg; • maximum load admitted 24 tons per axle of the truck.	02	 
002	**2nd half** of the washing lane's steel frame	Its function is to wash the truck, collect water, debris and sludge before to pump them to the clarification tank. • Length ≈ 4.000 mm • Inside width ≈ 1.450 mm • External width ≈ 1.685 mm • Height ≈ 355 mm (1.650 mm with anti-splash side walls); • Weight ≈ 1.600 Kg • maximum load admitted 24 tons per axle of the truck.	02	 
003	Steel Grate (in the middle of the wheel washing lane)	Material: galvanized steel Size: 780 mm x 1.000 mm x h 40 mm *It permits to walk through the washing lane (in the middle).*	08	

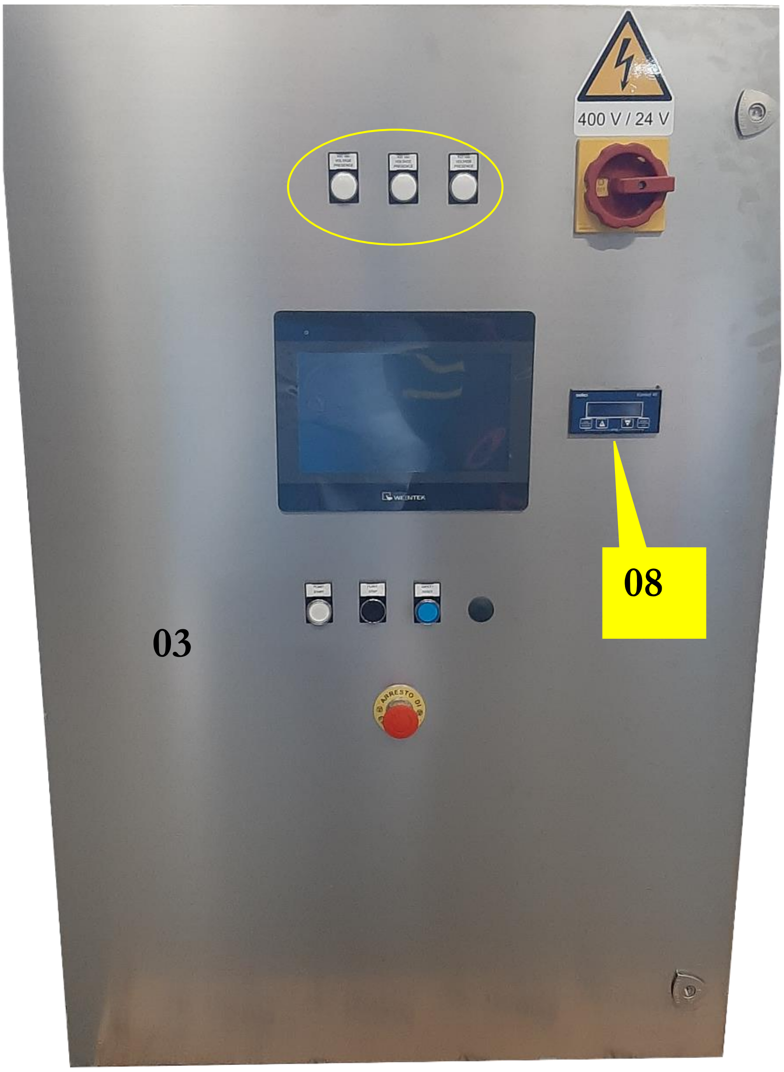
Part code	Component's Name	Function – Technical Data	Q.ty	Pictures
004	Washing column	Material: galvanized steel - Diameter 2" - Height ≈ 2.500 mm - n° of nozzles: 12 each COLUMN *They have to be installed two for each washing lane (entry side).*	04	
005	Lamella pack support frame	Material: varnished carbon steel - Total Length ≈ 4.200 mm - Width ≈ 1.980 mm - Hight ≈ 1.000 mm - Weight: ≈ 600 Kg *This part needs to increase sedimentation of the sediments (clarification of the water).*	01	
006	Mixing system	Mixing system composed by: - gearmotor of 0,55 kW power; - nr. 01 mixing axel; *This part needs to better mixing the chemicals in order to increase sedimentation of the sediments (clarification of the water).*	02	
007	Redler support frame and chain conveyor for sludge removal	Material: varnished HEA 140 steel profile - nr. of scrapers ≈ 12 - width of scrapers 800 mm - gearmotor power 1,1 kW *System helps to remove sludge settled into the sedimentation tank.*	02	
008	Solenoid Valve – Clear water connection from main grid	Material: brass Diameter: 1" female Flange ASME B16.5 300lb DN 1 ½" *This system permits to refill the tank with clean water from the main net*	01	
009	Deoiling system	Deoiling system - Power = 2x0.18 kW; - Material: steinless steel - Weight: around 40 Kg *This system permit to remove oil from the surface of water clarification tanks*	02	

Part code	Component's Name	Function – Technical Data	Q.ty	Pictures
010	Flocculant dosing pump	• Plunger Piston dosing pump with adjustable flow rate; • Pump head in PVC; • maximum pressure 10 bar; • Flow rate 0,15-1,5 l/h • Power 400V – 50Hz - 3P+N+PE - 0,18 kW;	01	
011	Coagulant & Neutralizing dosing pump	• Solenoid dosing pump with adjustable flow rate; • Pump head in PVDF; • Diaphragm in PTFE • maximum pressure 16 bar; • Flow rate 7-18 l/h • Power 100-240Vac – 22-36W;	02	
012	Chemical Storage Tank	Material: LLDPE Capacity: 100 lt Equipped with level sensor for dosing pump protection.	03	
013	Floating level sensor	Floating sensor model FINDER 72.A1.0.000.1001	06	
014	Level sensor	Level sensor for coagulant and neutralizing product. • *Body completely in PVDF* • *Sealing with epoxy resin* • *Contact wire sheath in PE*	02	
015	Traffic light and electrical box	Trafic light: • Red lighting: system not available • Green lighting: system available Electrical junction box: • through a cable is connected to main electrical control panel installed on the sedimentation tank.	02	
016	Basket filter	• 3" Clamp connection system; • 300 micron steel filter • renovable and easily removable; • two pressure gauges to read differential pressure; • discharge valve DN25.	04	

Part code	Component's Name	Function – Technical Data	Q.ty	Pictures
017	Submerged centrifugal washing pump	• Power = **8,5/7,5 kW**; • Flow rate ≈ 2.500 l/min.; • Flexible piping and sphericall connectors kit; • Roughing filtration group integrated on the pump. *This pump will fed both bottom and side washing collectors*	03 (01 spare)	
018	Submerged centrifugal waste water pump	• Power = **6,3/5,5 kW**; • Flow rate = 500 lt/min.; • Flexible piping and spherical connectors kit; *This pump will send waste water from wheel washing lane to sedimentation tank.*	03 (01 spare)	
019	Submerged centrifugal pump	• Power = **1,33/1,1 kW**; • Flow rate = 500 lt/min.; • Flexible piping and spherical connectors kit; *One pump is for the lift the water from tank 01 to tank 02, one pump is supplied loose for tank's drainage.*	02	
020	Main Electrical control panel	Electrical control panel for the general management of utilities and washing times. • AISI 304 stainless steel cabinet; • IP55 protection; • Siemens PLC; • Touch screen panel for a very easy management of the systems;	01	
021	Proximity sensor for automatic start/stop of the washing cycle	Sensor installed on side wall of the washing lane and it can be regulatet in direction. (Alternatively can be used pole for manual activation)	04	3 Km/h VELOCITA' MASSIMA CONSENTITA
022	Cooled and insulated container	Cooled and insulated container for the installation of: • electrical control panel • dosing station • chemicals storage tanks	01	
023	Walkway for maintenance and covering of clarified storage tank	Hot dip galvanized walkway Dimensions: mm5.000x1.970 Weight: 500 Kg	01	


PART CODE 022
Cooled container
for protection of:
PART CODE 010
- 011 - 012 - 014 -
020
PART CODE 009
Deoiling System
PART CODE 008 - Solenoid
Valve for water refilling
PART CODE 005
Lamella Pack
Frame
Oil trap
PART CODE 006
Mixing Systems
Lamella pack
Mixing System
PART CODE 016-017-018
PART CODE 009
Deoiling System
PART CODE 004
Washing Columns
PART CODE 004
Washing Columns
PART CODE 001
PART CODE 002
PART CODE 003
PART CODE 019
PART CODE 007 - Support
frame for sludge extractor
PART CODE 007 - Support
frame for sludge extractor

ELECTRIC CONTROL PANEL – WHEEL WASHING SYSTEM



01	**Indicator light “VOLTAGE PRESENCE”**
02	**Black Button to STOP the system**
03	**White button to START the system (automatic working cycle)**
04	**Blue button - Reset Auxiliary (This button must be pushed to reset any alarms and to operate the system before press START button)**
05	**Operator touch screen panel**
06	**Master switch**
07	**Emergency button located on the control panel**
08	**PH controller – Panel that shows PH level of the water into clarification tank and manage NaOH dosing pump.**

2.3. Assembly of the system

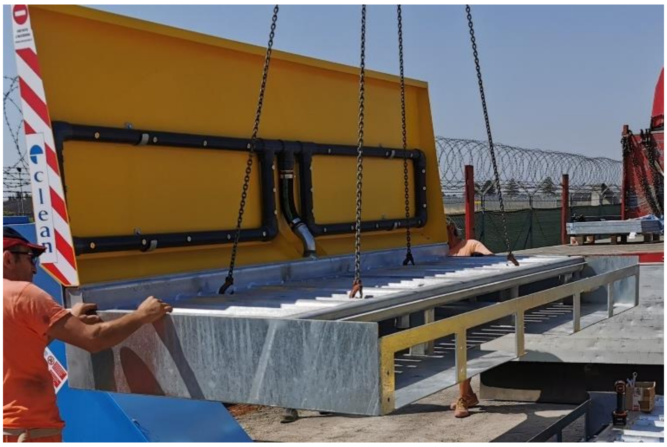
Before begin the installation, check if the concrete platform has the right dimensions and if it respects project specifications in all of its parts.

Steps to be taken for the assembly

1) place container with electrical control panel in the right position and fix it to the ground with fixing bolts (crane requested);

External dimensions: mm 3.110 x 2.190 x h2.445;
Weight (with internal equipment): ≈700 Kg;
Lifting point on the roof

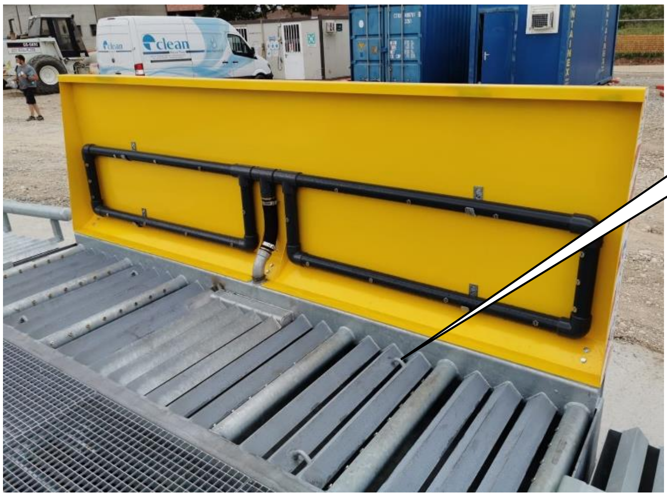
2) place wheel washing lanes (08 pieces-part code 01 and 02) and assemble them (crane requested);



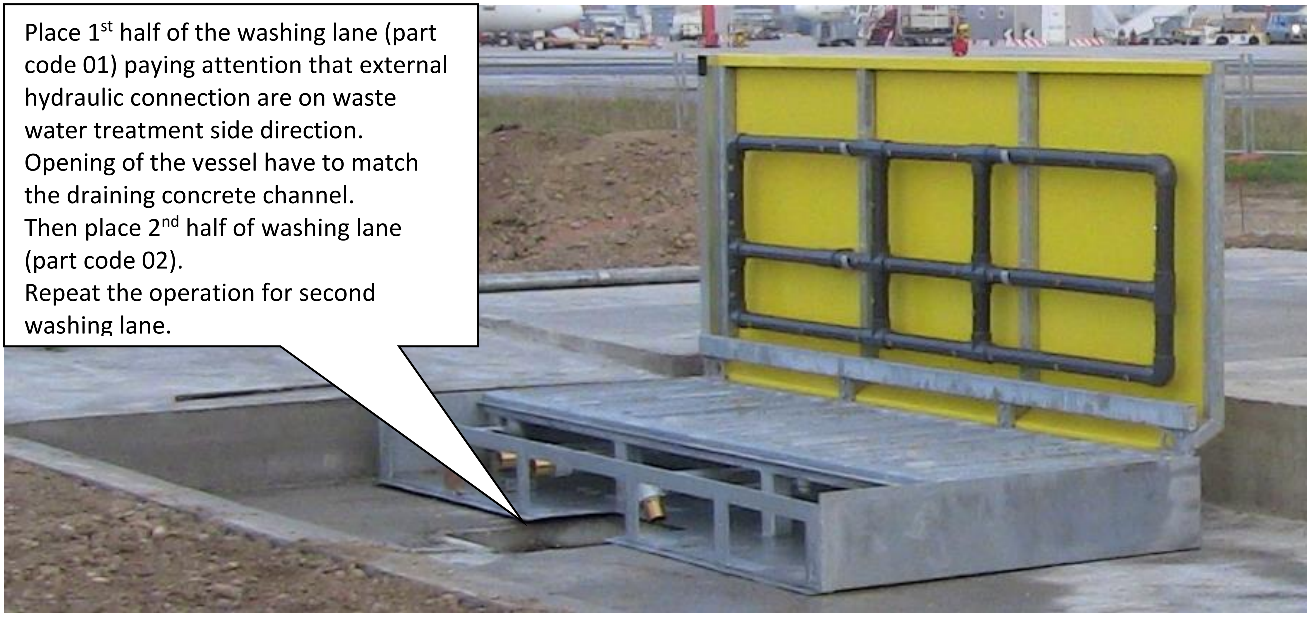
02 wheel washing lanes are composed by a total number of 08 pieces:

- 04 base parts;
- 04 side wall's extension.

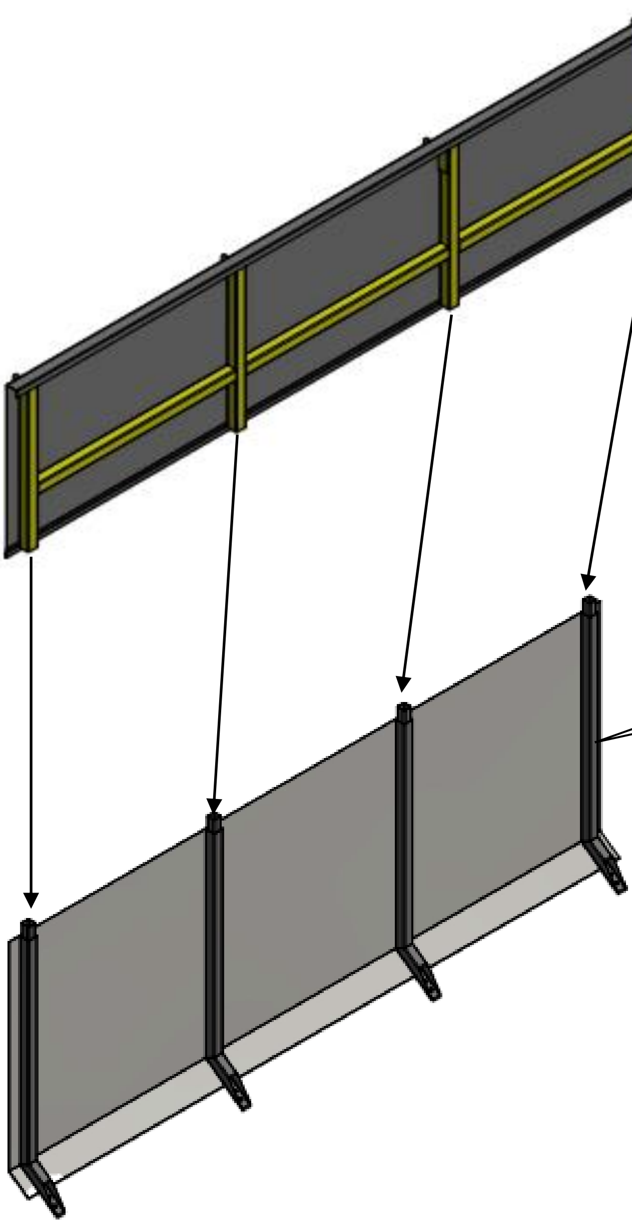
Base part dimensions:
mm 4.000 x 1.550 x h 350-1.500
Base part weight: ≈1.500 Kg;
Side wall's extension dimensions:
mm 4.000x1.000x150
Side wall's extension weight: ≈150 Kg;



Lifting points

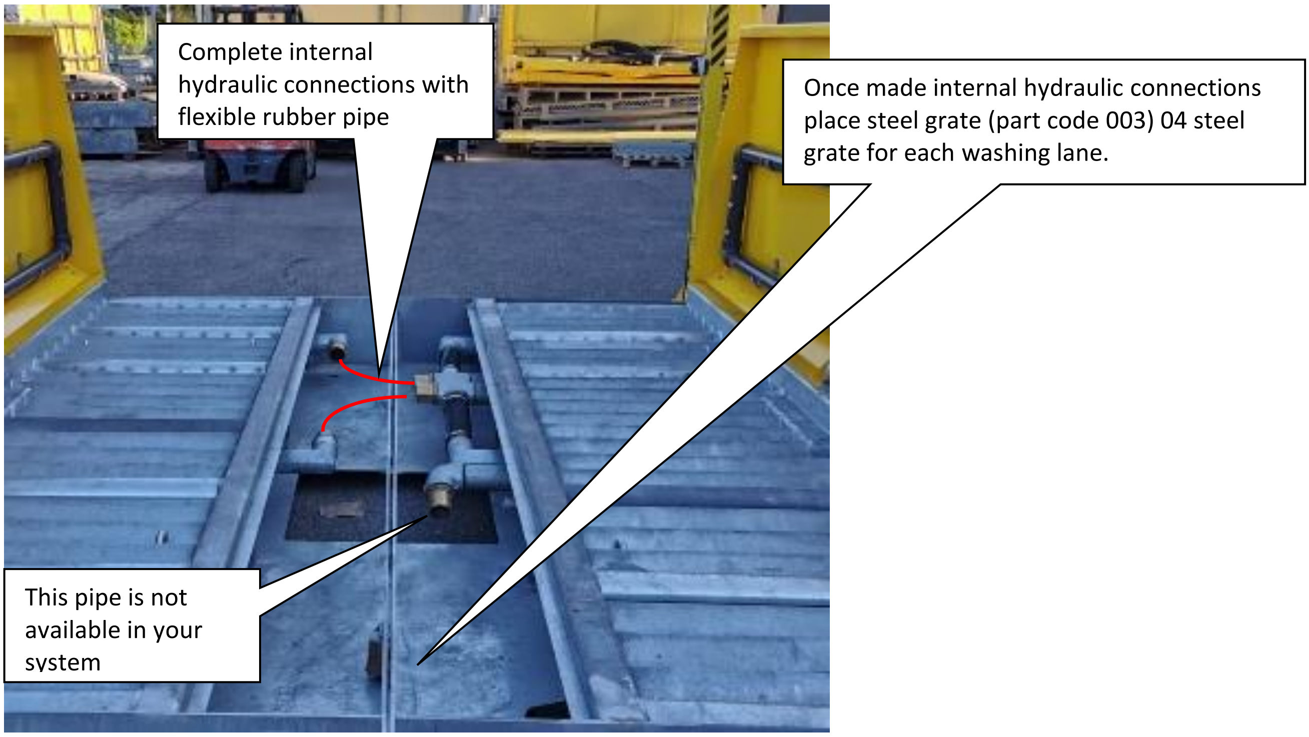


Place 1st half of the washing lane (part code 01) paying attention that external hydraulic connection are on waste water treatment side direction.
Opening of the vessel have to match the draining concrete channel.
Then place 2nd half of washing lane (part code 02).
Repeat the operation for second washing lane.



Install side wall's extension on both wheel washing lanes by matching fixing systems.

This part is already installed on the washing lane's base

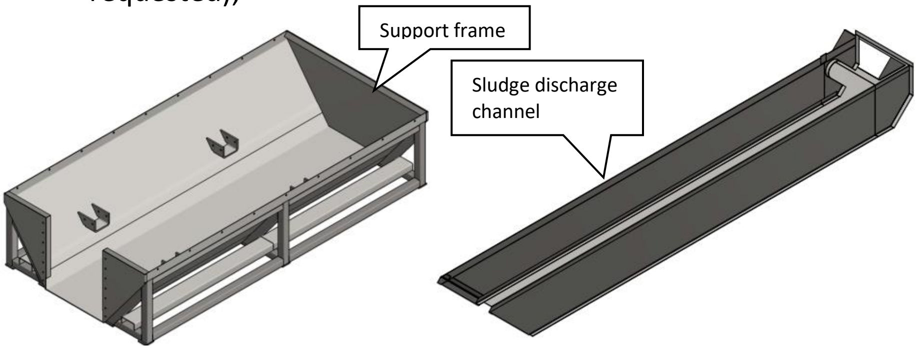


Complete internal hydraulic connections with flexible rubber pipe

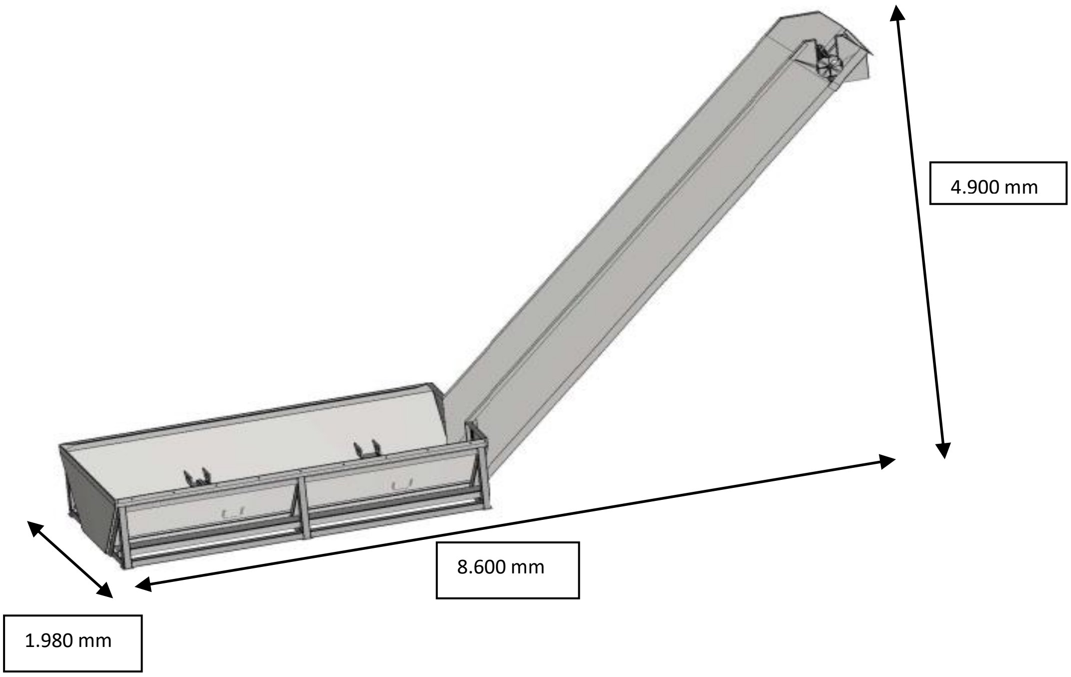
Once made internal hydraulic connections place steel grate (part code 003) 04 steel grate for each washing lane.

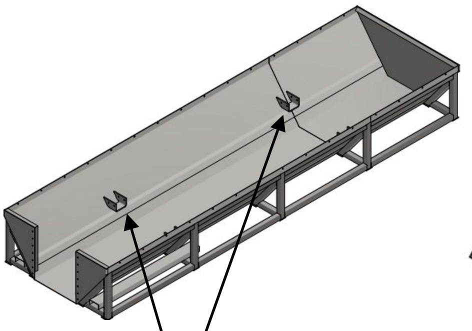
This pipe is not available in your system

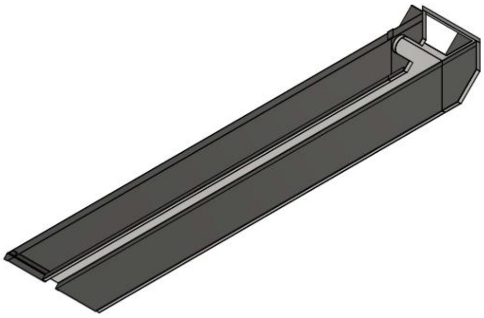
3) assemble and place into concrete tank both redler support frames and chain conveyor for sludge removal (part code 07) and then fix them to concrete tank with fixing bolts (crane requested);



Redler's support frame and sludge discharge channel for TANK 01. Two parts have to be connected with fixing bolts and once assembled placed into TANK 01. Weight of the structure assembled: ≈960 Kg;

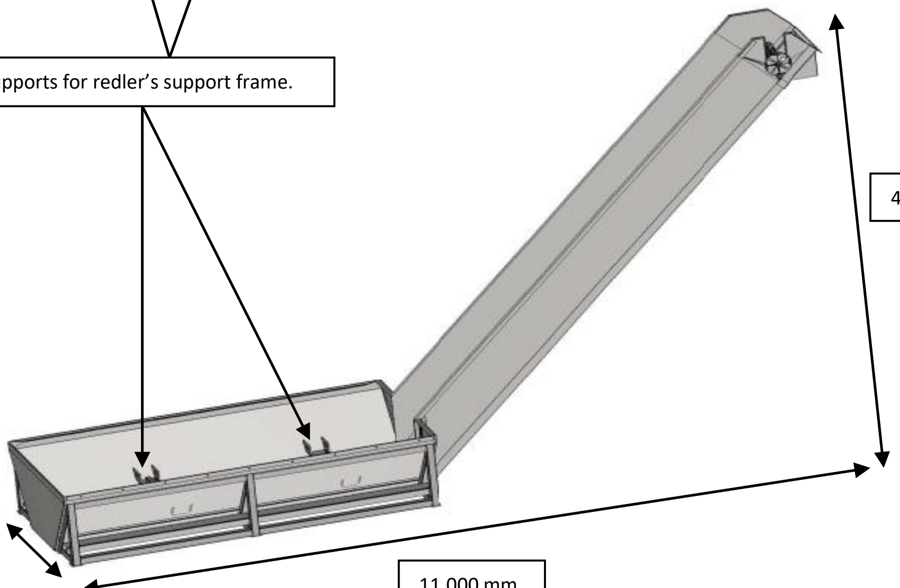






Redler’s support frame and sludge discharge channel for TANK 02.
Two parts have to be connected with fixing bolts and once assembled placed into TANK 02.
Weight of the structure assembled: ≈1.200 Kg;

Supports for redler’s support frame.

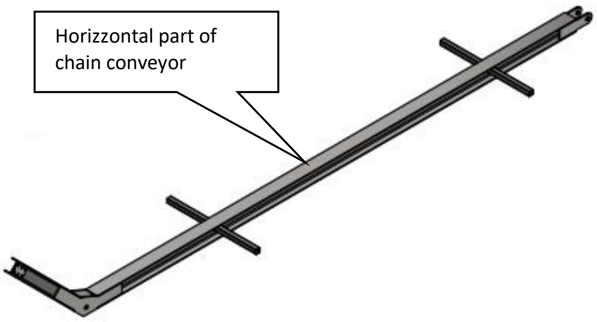


4.900 mm

11.000 mm

1.980 mm

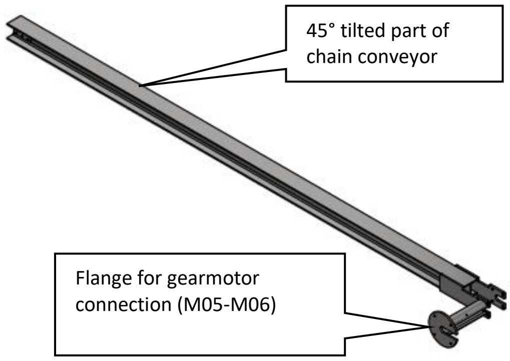
Horizzontal part of chain conveyor



Once placed the two redler’s support frames into tank 01 and 02 is time to assemble the conveyor frame by connecting with steel plate horizontal part and tilted part of the structure.

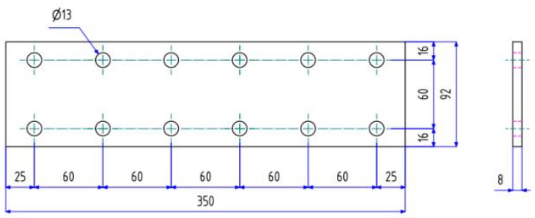
Structure for TANK 01 total weight: ≈ 470 kg
Structure for TANK 02 total weight: ≈ 610 kg

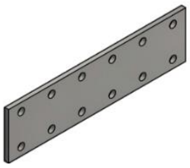
45° tilted part of chain conveyor

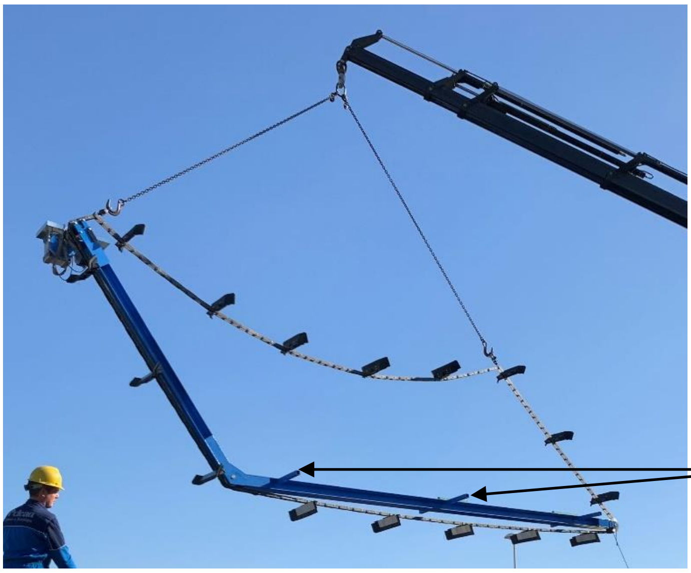


Flange for gearmotor connection (M05-M06)

Steel plate for connection of two parts



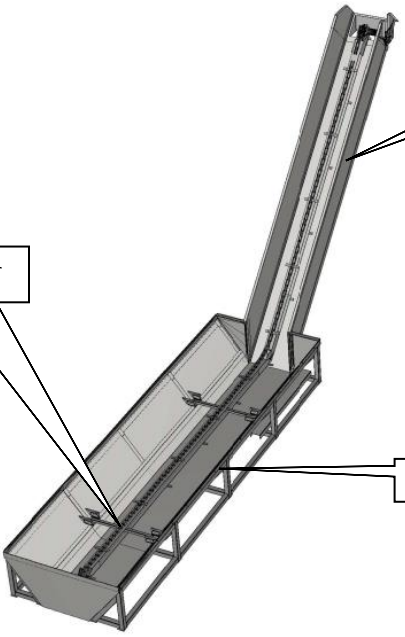




Once assembled the conveyor frame by connecting with steel plate horizontal part and tilted part of the structure is time to equipped the same with chain, scrapers and gearmotor.
When the system is completely assembled it can be placed into redler's support frame into TANK 01 and TANK 02.
Support legs of the conveyors must be fixed with bolts to supports of redler's support frame.
TEST TO BE DONE TO VERIFY CORRECT INSTALLATION:

- activate the system and look if scraper turn in right direction (looking at the gearmotor it has to turn in counter clockwise direction) and if scraper will be in contact with bottom of both the tank and sludge removal channel.

Support legs of the conveyors to be be fixed with bolts to supports of redler's support frame.

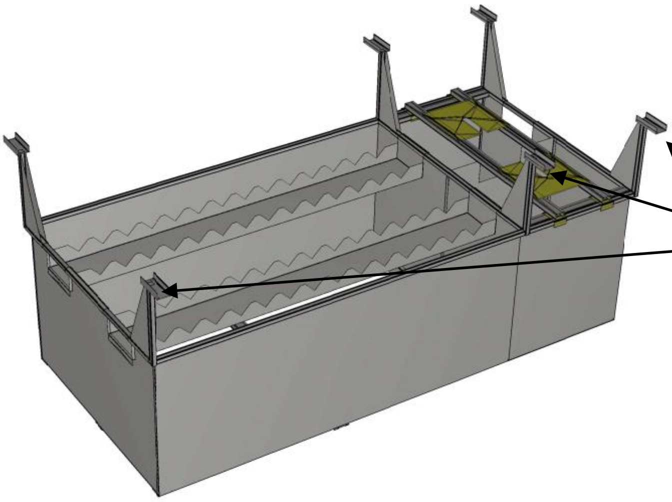


SLudge removal channel

Scraper conveyor

Support frame

4) place lamella pack support frame (part code 05 and 06) into tank 02 and fix it to concrete tank with fixing bolts (crane required);

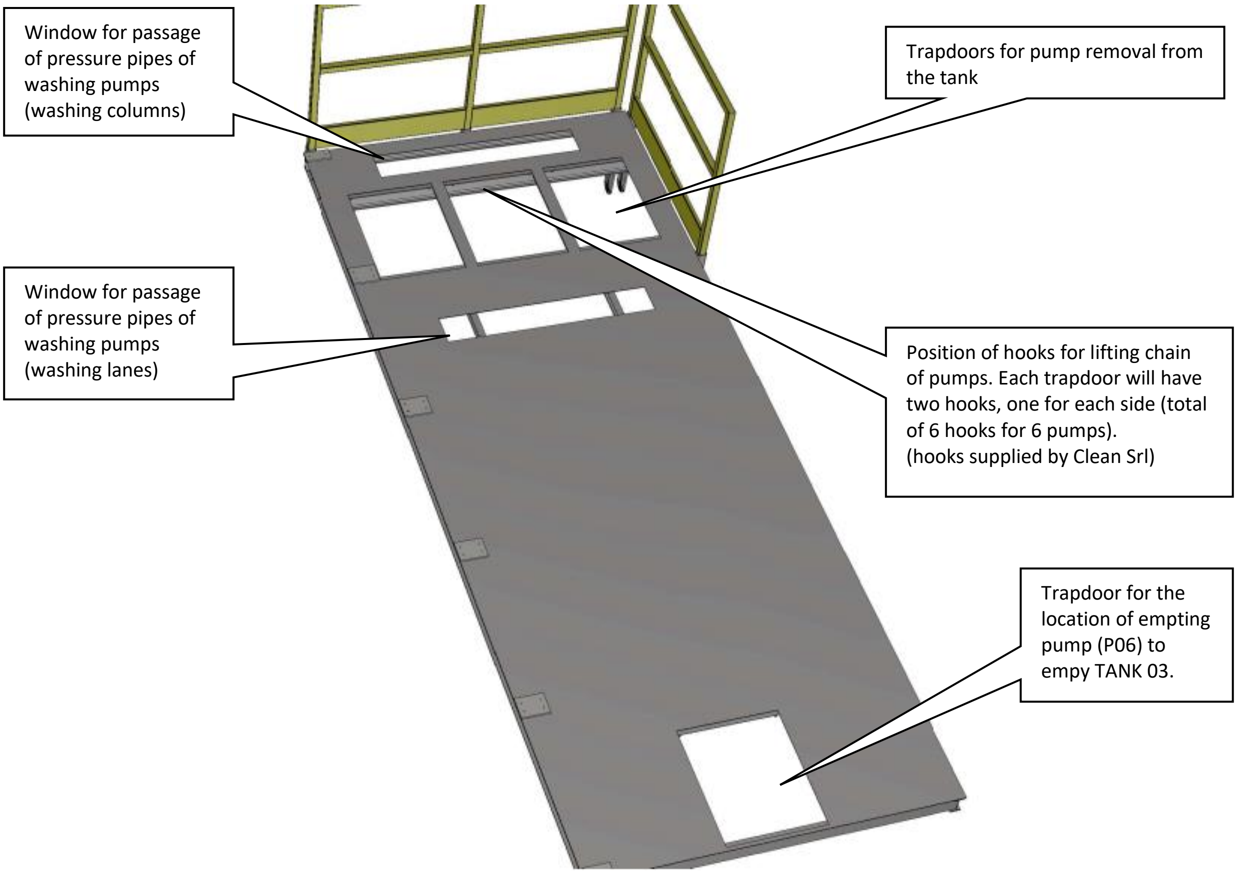


Lamella pack's support frame will be already equipped with lamella pack and mixing systems, ready to be placed into TANK 02.
Dimensions: mm 4.200 x 1.980 x h 1.000
Weight: ≈ 600 kg

Lifting points with eyebolts

5) place washing pumps (P01-P02-P03-P04-P07-P08) into the clarified water storage tank and pumps for water treatment (P05) in tank 01 – (crane, forklift or lifting system required);

All the washing pumps will be already equipped with support base and ready to be located into the tank. **Is NOT necessary to fix them on the bottom of the tank.**
Each pump will be equipped with chain for removal from the tank for maintenance. Chain will be connected to pump and to walkway (part code 023) once placed. On the walkways will be located hooks in correspondence of the trapdoor for pump removal from the tank.
Waste water pump P05 will be installed into tank 01 thanks to support frame that will be fixed to concrete tank.



Window for passage of pressure pipes of washing pumps (washing columns)

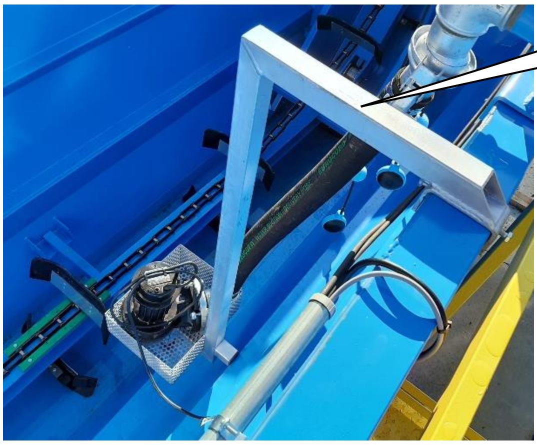
Trapdoors for pump removal from the tank

Window for passage of pressure pipes of washing pumps (washing lanes)

Position of hooks for lifting chain of pumps. Each trapdoor will have two hooks, one for each side (total of 6 hooks for 6 pumps).
(hooks supplied by Clean Srl)

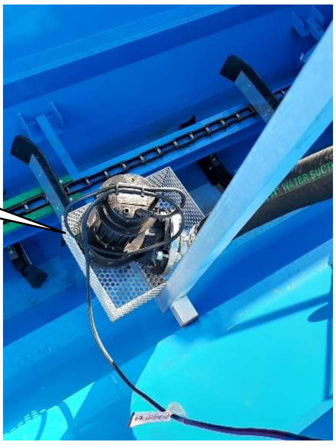
Trapdoor for the location of empting pump (P06) to empy TANK 03.

FOR INSTALLATION OF WALKWAY PLEASE REFER TO FOLLOWING POINT 6).

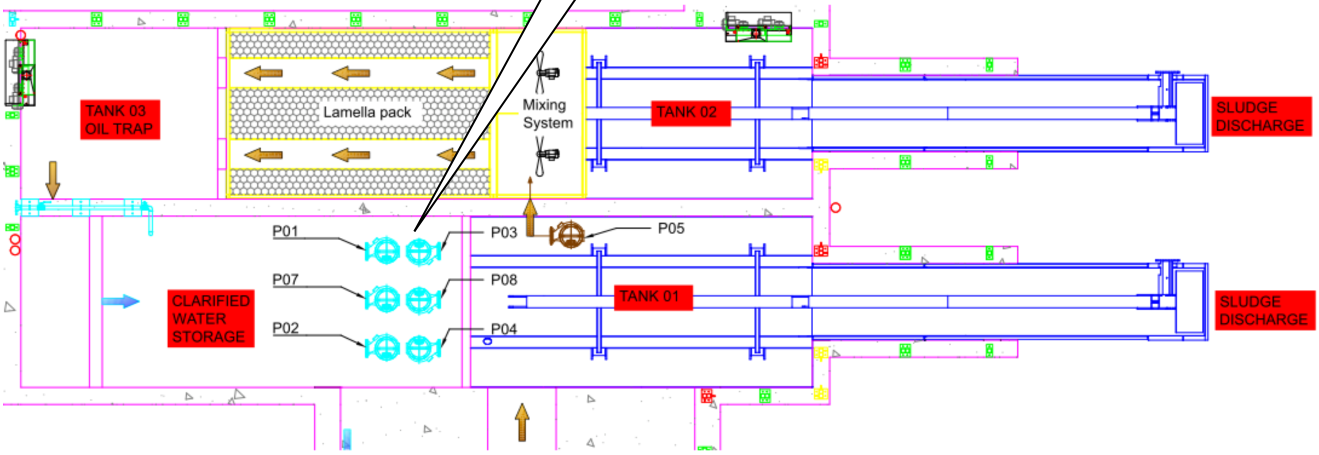


Support frame of pump 05 to be fixed on concrete tank

Pump 05 to be installed into tank 01

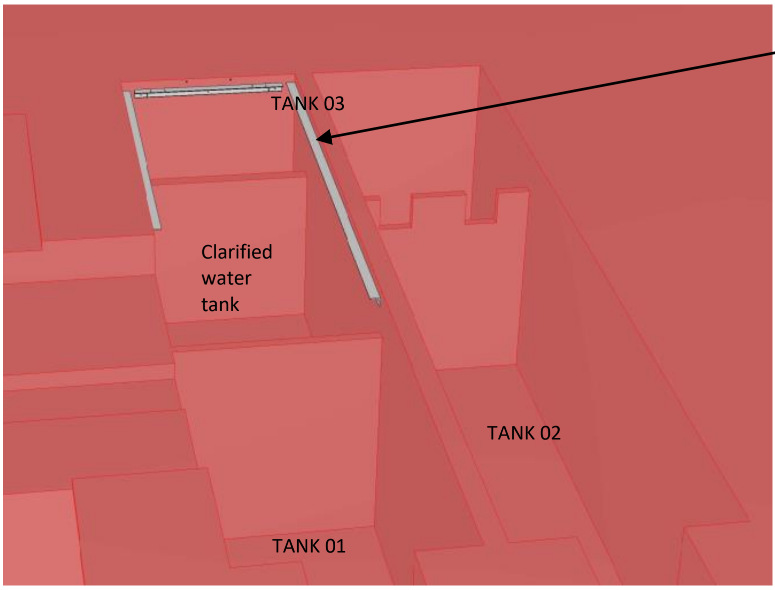


PUMP'S POSITION


TANK 03
OIL TRAP
Lamella pack
Mixing System
TANK 02
SLUDGE DISCHARGE
P01
P03
P05
P07
P08
TANK 01
CLARIFIED WATER STORAGE
P02
P04
SLUDGE DISCHARGE

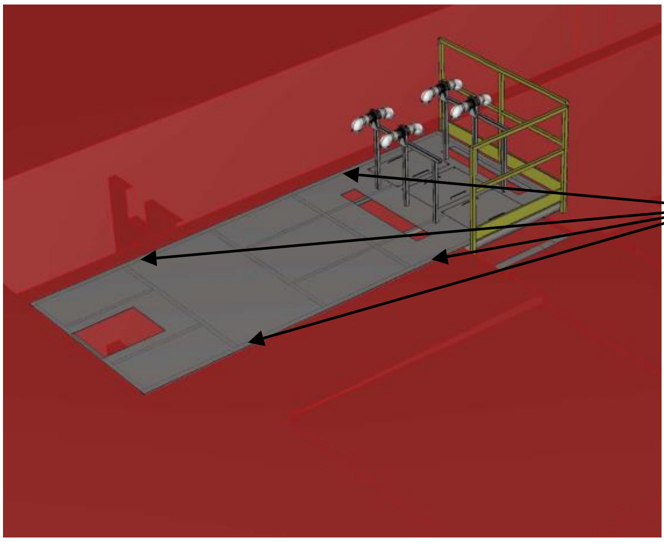
6) place deoiling systems (oil skimmer) in the right position and fix them with fixing bolts (for more details about installation look at the specific manual attached) - (crane, forklift or lifting system required);

7) install steel angular profiles on the side walls of clarified water storage tank by fixing bolts (they are support for walkway) – crane or lifting system required;


TANK 03
Clarified water tank
TANK 02
TANK 01

Steel angular profiles to be fixed to concrete tank with bolts.
(BOLTS SUPPLY BY Clean Srl)

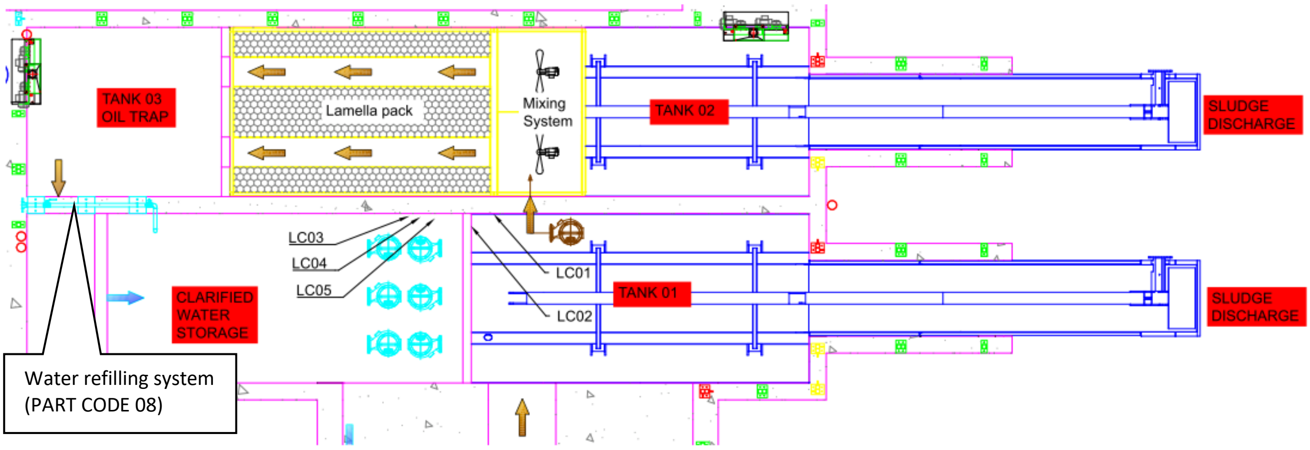
8) place walkway on the clarified water storage tank - crane or lifting system required;

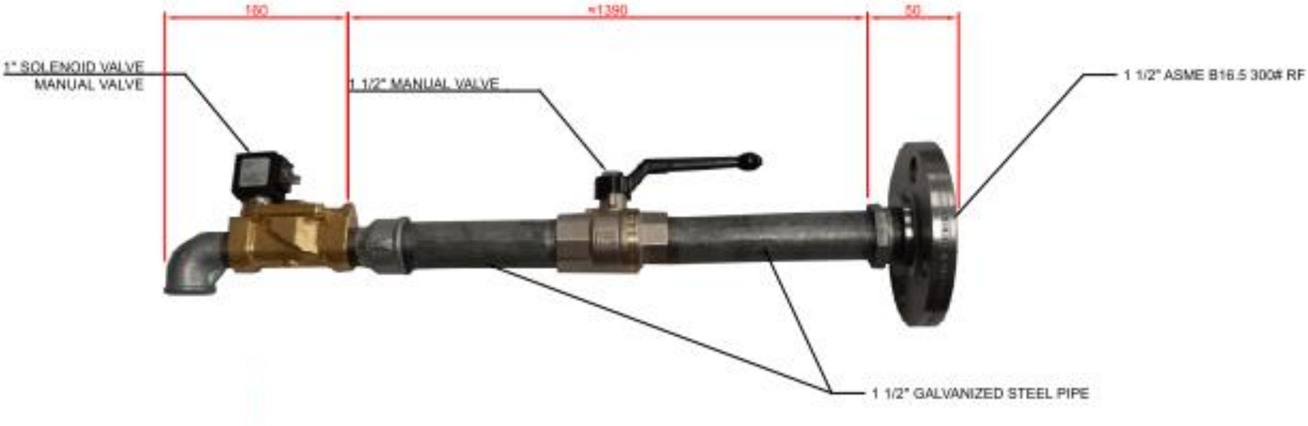


Hot dip galvanized walkway (part code 023)
Dimensions: mm5.000x1.970
Weight: 600 Kg;

Lifting point with eyebolts.

9) place water refilling system by connected to the concrete tank with fixing bolts (supplied by Clean Srl) and install all floating level sensors into the tanks (look at the picture below for the position of the sensors LC-XX). Floating sensors for chemicals are already installed into storage tanks (PART CODE 012 and 014);


TANK 03
OIL TRAP
Lamella pack
Mixing
System
TANK 02
SLUDGE
DISCHARGE
LC03
LC04
LC05
CLARIFIED
WATER
STORAGE
LC01
LC02
TANK 01
SLUDGE
DISCHARGE
Water refilling system
(PART CODE 08)


160
≈1390
50
1" SOLENOID VALVE
MANUAL VALVE
1 1/2" MANUAL VALVE
1 1/2" ASME B16.5 300# RF
1 1/2" GALVANIZED STEEL PIPE

PICTURE ABOVE - Water Refilling System

10) install safety rail by installing support bases to concrete platform by bolts (supplied by Clean Srl) and then position the safety rail;

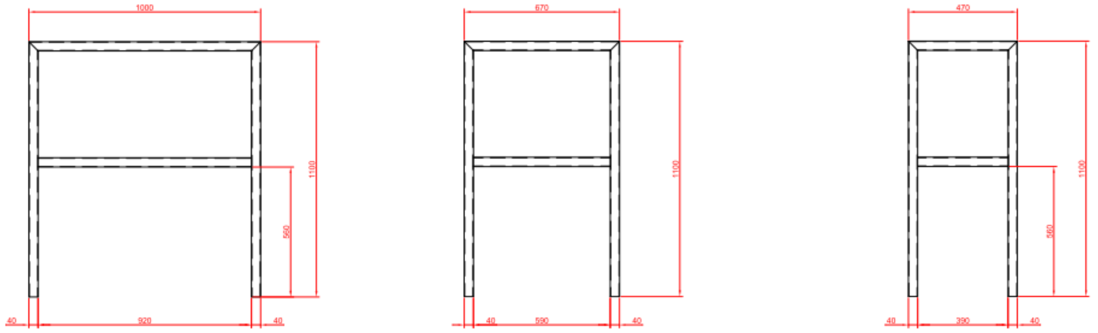
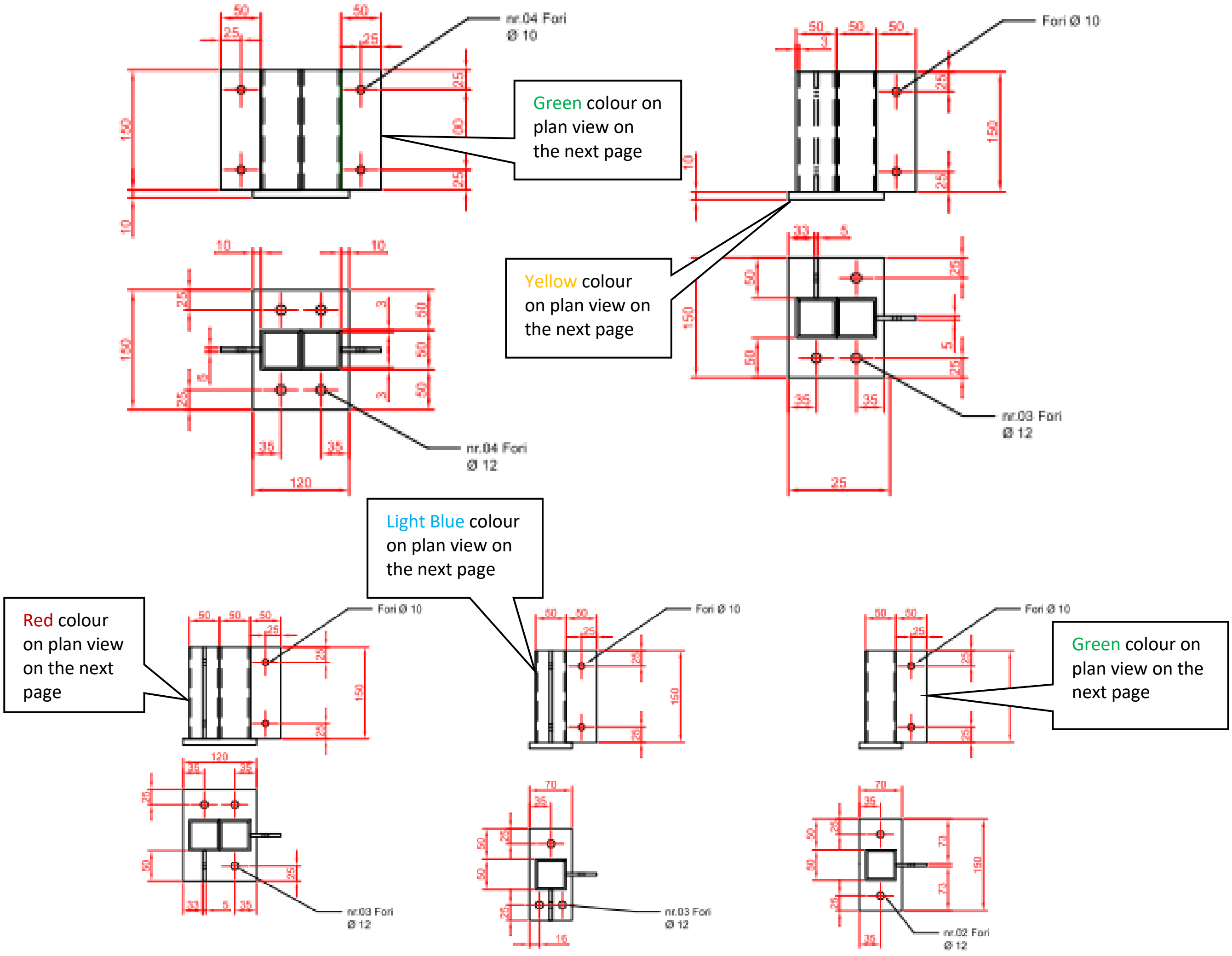

1000
1100
560
40
920
40
670
1100
40
590
40
470
1100
560
40
390
40

IMAGE ABOVE: Safety rail – hot dip galvanize steel – 03 types for different position

IMAGES BELOW: Safety rail’s support bases – hot dip galvanize steel – Several typology for different position


nr.04 Fori
Ø 10
Fori Ø 10
nr.04 Fori
Ø 12
nr.03 Fori
Ø 12
120
150
Fori Ø 10
Fori Ø 10
Fori Ø 10
nr.03 Fori
Ø 12
nr.03 Fori
Ø 12
nr.02 Fori
Ø 12

Green colour on plan view on the next page

Yellow colour on plan view on the next page

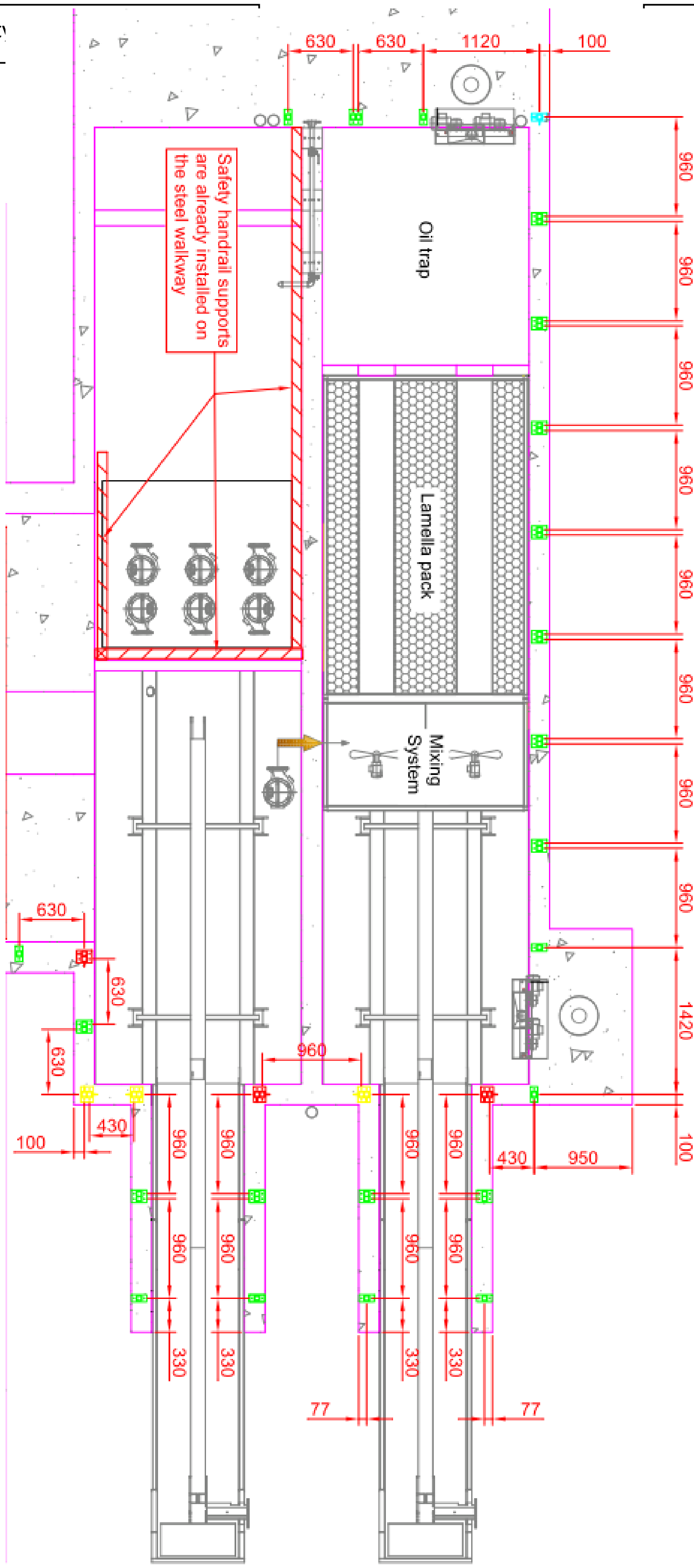
Light Blue colour on plan view on the next page

Red colour on plan view on the next page

Green colour on plan view on the next page

Plan view for safet

ail's support


630
630
1120
100
Safety handrail supports are already installed on the steel walkway
Oil trap
Lamella pack
Mixing System
960
960
960
960
960
960
960
960
1420
100
630
630
630
100
430
960
430
950
960
960
960
960
960
960
960
960
330
330
330
330
77
77

11) make electrical/hydraulic connections of complete system and in particular:
    a. main hydraulic connection to water main net to start the filling of water inside the system (at charge and care of the customer);
    b. electrical connection of all devices of the system (gearmotor of sludge extractor system, oil skimmer, pumps, floating sensor, mixing systems, optical sensors, traffic lights) – at Clean Srl charge and care;
    c. internal hydraulic connections (connection between washing pumps and wheel washing lanes/washing columns, connection between dosing pumps and mixing systems) – at Clean Srl charge and care.
12) Start Up of the system making all functioning tests (right rotation of pumps motor, right rotation of sludge extractor, right rotation of oil skimmer's gearmotors, right rotation of mixing systems, tests of all the floating sensors simulating different water level and testing alarms show on the control panel, set all the parameters for right working cycle of wheel washing lane and water treatment system);
13) Training to the customer's operators explaining even where they can find problem solving on this USER MANUAL.

2.4. General informations about plant’s working cycle

Automatic washing cycle – Plant operation.

System in managed thanks to a dedicated PLC and one operator panel (touch screen).

One optical proximity sensor, for the activation of the washing cycle, is installed at the entrance of each washing lane, (proximity sensor can be replaced by manual activation - advisable).

To be able to proceed to the washing cycle, driver has to approach close to the **optical sensor** (it works up to around 5 meters of distance) and, if traffic light is green, hasto wait for the complete pressurization of the washing system before proceeding with the advancement of the vehicle inside of the lane.

The washing cycle ends upon reaching of a *predetermined washing time* settable thanks to the touch screen panel located on the main electrically control panel or when the *trucks exit* the washing lane.

To clean all the circumference of the wheel it’s important that truck advances into the lane (if wheels are very dirty it can be possible to make some stops into the lane or going through twice to complete the cleaning).

Automatic Washing Cycle – Traffic light indications.

Each washing lane is equipped with traffic light in order to show the state of the washing system:

GREEN LIGHT: indicates that the track is available for the execution of washing; in this condition the vehicles can proceed with the washing cycle;

RED LIGHT: indicates that the system is engaged or not available because:

1. system is still engaged in some operations (washing cycle still active or waste water pump is still pumping the water back to sedimentation tank);
2. some alarm occurred (look at the touch screen panel to understand which is the problem).

Managing of waste water / sludge – Water treatment cycle

After the washing cycle, waste water that falls into the washing lane is collected into the bottom tank and from there, thanks to the concrete channel, into the TANK 01 (look at drawing at page 26). Tank 01 has double function: 1) primary sedimentation of sand or other sedimentable solids 2) creates storage volume to permit to the TANK 02 to treat right water flow (around 30 m³/h).

From TANK 01, thanks to submergible pump P05, waste water is sent into MIXING SYSTEM (located into TANK 02) where chemicals are added to the water in order to increase sedimentation of suspended solid. Mixing system is divided in two sections. Into section 01 are added both coagulant product ($FeCl_3$ 40% - **not supplied by Clean Srl**) and neutralizing product (NaOH – **not supplied by Clean Srl**) and is measured even PH of water. Dosage of neutralizing product is automatic thanks to PH control system, dosage of coagulant has to be regulated during commissioning and adjusted if the sedimentation of the sediment is not optimal. Into section 02 is added flocculant product (**supplied by Clean Srl**) and dosage has to be regulated during the commissioning and adjusted time to time if sedimentation is not optimal.

From mixing system water goes into the free zone of TANK 02 where DEOILING SYSTEM M-03 will remove floating oil and greases. From free zone of tank 02 the water pass from the bottom of the tank into LAMELLA PACK (located into TANK 02) that has the function to increase surface of sedimentation in order to increase and make better the clarification of water.

From lamella pack into TANK 02, water goes into TANK 03 that has the only function to create a trap for oil and greases that escape from TANK 01. Into TANK 03 is installed DEOILING SYSTEM M-04 in order to remove other oil and greases.

From tank 03 water goes into CLARIFIED WATER STORAGE TANK where washing pumps are installed and the water treatment ends.

Sludge (settled solid into tanks 01 & 02) is removed from the tank thanks to automatic scraper that discharge sludge at 1.5 meters from ground level (look at the picture on page 26): it's necessary to locate a watertight tank in order to collect sludge and dispose this waste according to law regulations.

Water level control into clarification tanks (look at document A0102 for nomenclature)

Some floating sensors are installed into the water treatment system in order to regulate the water flow and the correct working of the washing lanes.

VERY IMPORTANT: when the plant is not working **water level of the TANK 01 must be at minimum level and the other tanks must be on top level.**

Sensor list is the following:

- LC01 – Installed into tank 01 it protects pump (P05) in case of minimum level of water – the system will continue to work in a proper way it's only pump's protection (NO ALARM WILL BE DISPLAYED on touch screen panel);
- LC02 – Installed into tank 01 it stops washing pumps because of maximum water level into the tank (washing lanes don't work till the level into tank 01 permits another washing cycle). It's necessary to wait that water treatment treats the water (around 500 lt/minute) – (ALARM "TANK 01 MAX LEVEL" WILL BE DISPLAYED ON THE PANEL – it must be waiting that P05 empty the TANK 01 and treatment will be ok – NO OPERATION REQUIRED BY OPERATOR);
- LC03 – Installed into clarified water storage tank and it protects washing pumps in case of minimum level – ALARM "TANK 04 MIN LEVEL" WILL BE DISPLAYED ON THE PANEL – it's necessary to wait that, if P05 is working, water come back from TANK 01 to TANK 04 (NO OPERATION REQUIRED BY OPERATOR), if pump P05 is not working because no water is inside TANK 01, it's necessary to refill new water into the system (OPERATION REQUIRED BY OPERATOR IF IT'S NOT ACTIVATED AUTOMATIC REFILLING OF WATER);
- LC04 – Installed into clarified water storage tank and it stops pump P05 in case of maximum level to avoid overflow discharge - (NO ALARM WILL BE DISPLAYED on touch screen panel and washing lane will work properly if "TANK 01 MAX LEVEL" (LC02) is NOT active.
    - In case that alarm "TANK 01 MAX LEVEL" is active and LC04 will stop pump P05 because of maximum level even into TANK 04 alarm "MAX LEVEL T01 AND T04" will be displayed and will be necessary manually emptying TANK 01 - OPERATION REQUIRED BY OPERATOR;
- LC05 – Installed into clarified water storage tank, it manages solenoid valve (SV01-EVY01) for restore the right level of clean water into the system; solenoid valve is managed even to a clock that can be set through the touch screen panel on the electrical control panel in order to choose when the system will refill the clean water (it's advisable to refill water when the system is not operative for minimum 4 hours maybe during night). If will be necessary refill

water manually it can be done with manual switch on control panel (look at chapter 3.2 – Operator Touch screen panel).

- LC06, LC07, LC08 – installed into chemicals storage tanks for protection of dosing pumps in case of low level of chemicals product (ALARM WILL BE DISPLAYED – System will continue to work – Operator has to refill chemicals inside the chemical storage tanks).

On clarified water storage tank (TANK 04) is located even the overflow discharging pipe.

VERY IMPORTANT: to avoid annoying operation is necessary to avoid that all the system will be full of water at maximum level, mainly (TANK 01 and TANK 04), IN THIS CASE WILL BE NECESSARY TO MANUALLY EMPTY TANK01 (look at what described on LC04 point in previous page).

Waste (sludge-oil):

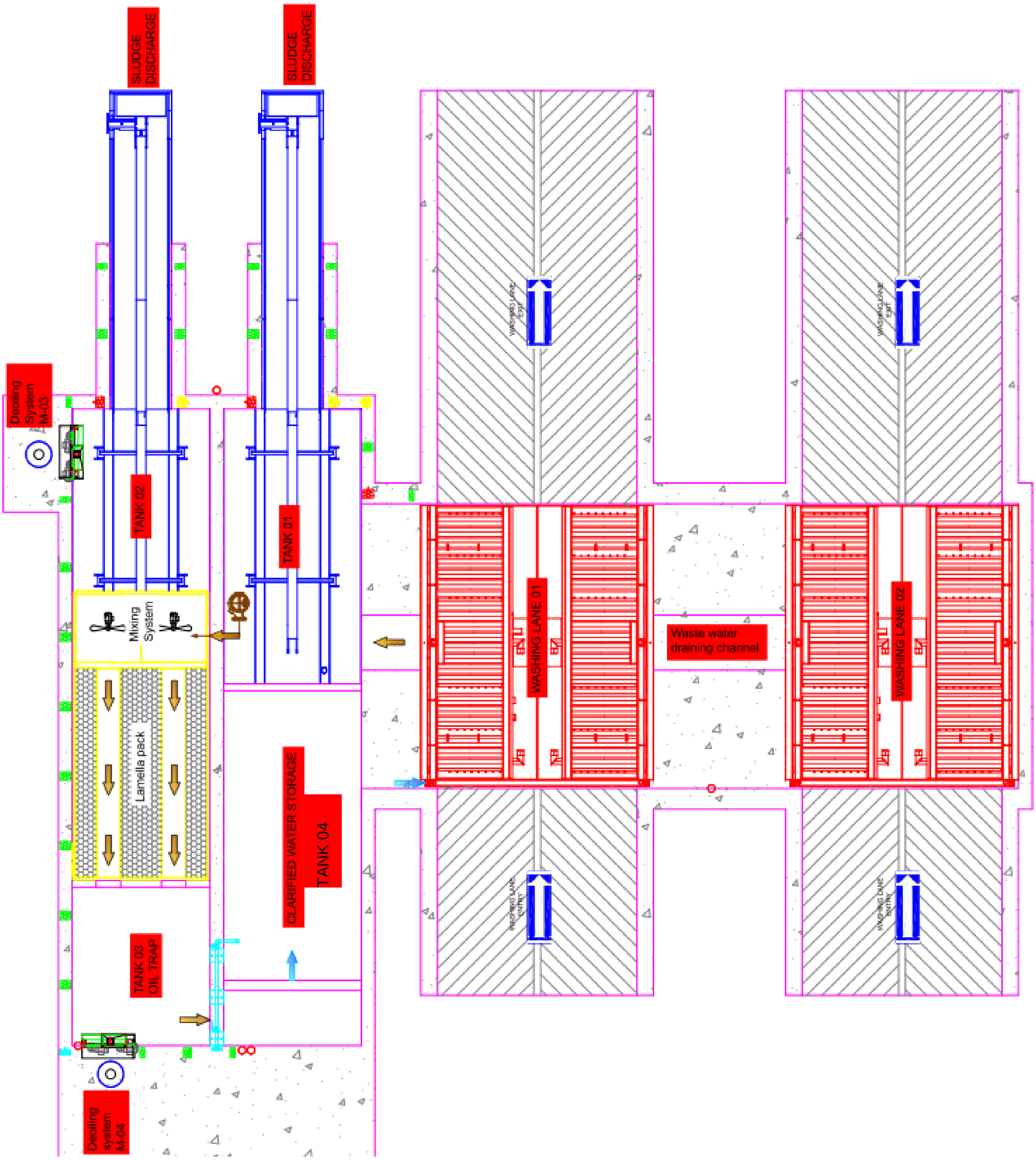
Wheel washing system generates two main kinds of waste:

1. sludge from sludge removal system;
2. oli and greases removed from the water surface by deoiling systems and storage into 100 lt. tank (supplied by Clean Srl).

Both liquid and solid waste must be disposed by authorized companies for disposal. They will have to perform analysis and characterization of the waste.

The producer of the waste must carry the 'basic characterization' of each incoming waste in landfills. Basic characterization must be carried out in correspondence with the first provision and repeated at every significant change in the process which originates the waste.

Level of liquid and solid waste into respective storage tanks have to be checked periodically by operator in order to avoid spillage and environment pollution.


SLUDGE DISCHARGE
SLUDGE DISCHARGE
Deoiling System M-03
TANK 02
TANK 01
Mixing System
Lamella pack
CLARIFIED WATER STORAGE
TANK 04
TANK 03 OIL TRAP
Deoiling system M-04
WASHING LANE exit
WASHING LANE exit
WASHING LANE 01
Waste water draining channel
WASHING LANE 02
WASHING LANE entry
WASHING LANE entry

3. Correct use and maintenance

3.1. Plant Operation – Start-up of the system

For the start-up of the system:

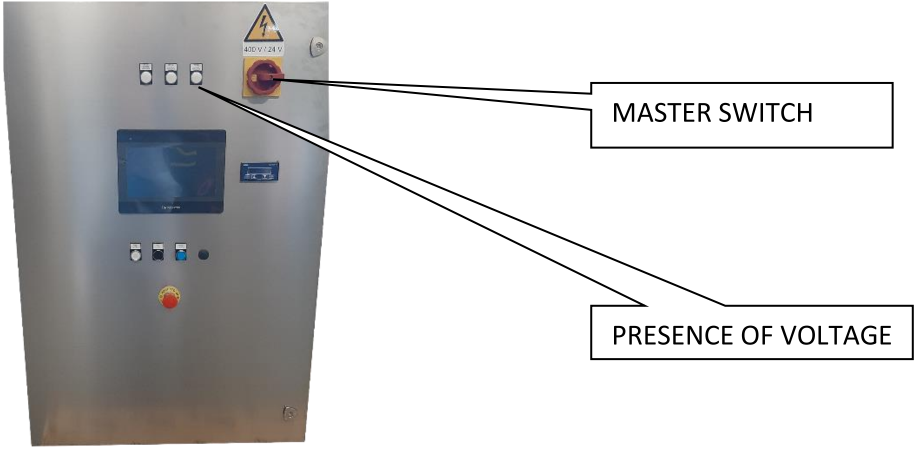
1. Request to the technical who operates the plant consensus to start the system;
2. Check that water levels into tanks is correct and it means:

   VERY IMPORTANT

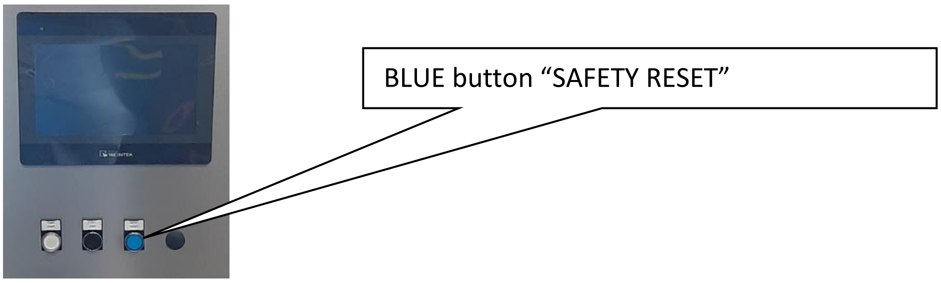
   a. TANK 01 is at minimum level (or in any case low water level that admitt discharge of waste water from washing lanes);

   VERY IMPORTANT

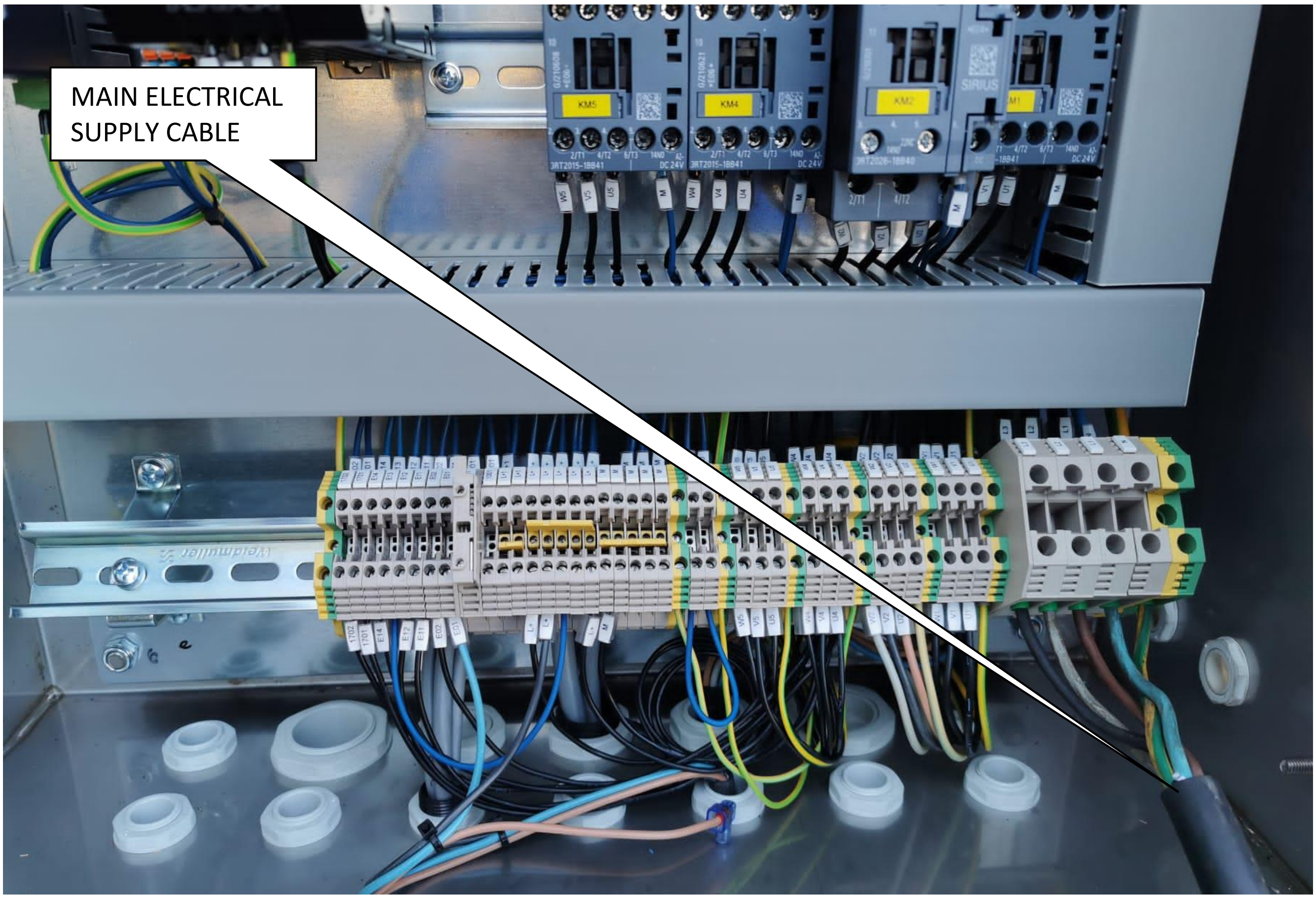
   b. CLARIFIED WATER STORAGE TANK is full (or in any case enough water for the activation of washing lanes);
3. Switch on **Master Switch** to give power to the system (turn it **ON**) and wait software loading (**Indicator light "LINE" should be lighting)**



4. Push **BLUE button** "RESET AUXILIARIES"

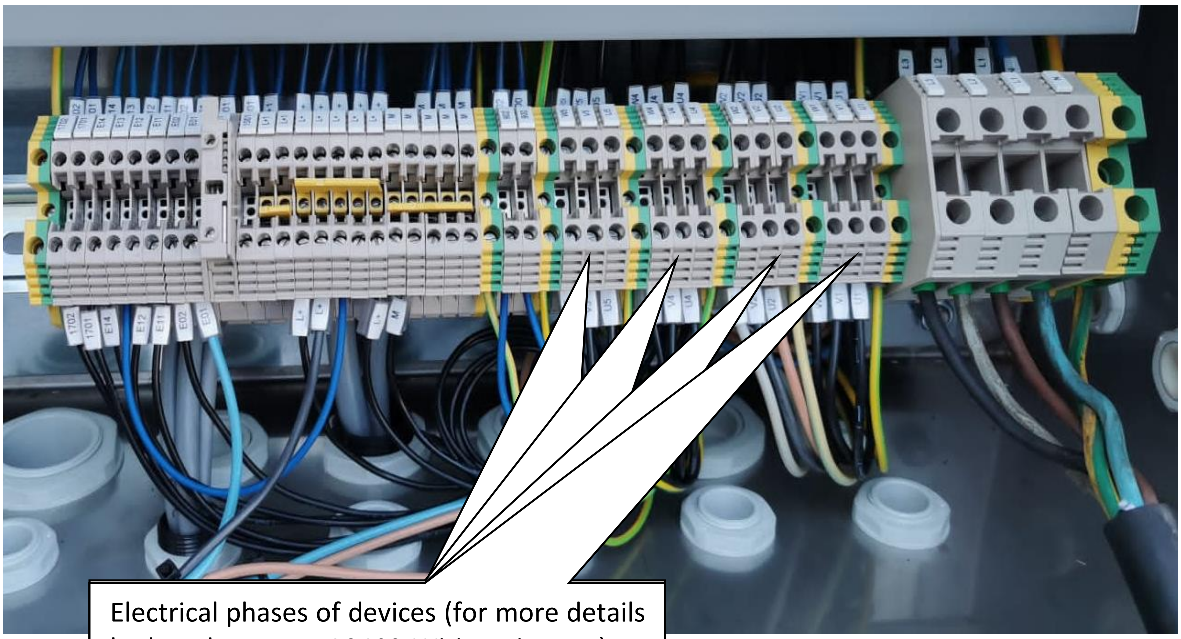


5. Check if some alarms occurred. If alarm “lack or incorrect phase sequence” is ON, it will be necessary reverse electrical phases of the main electrical supply.



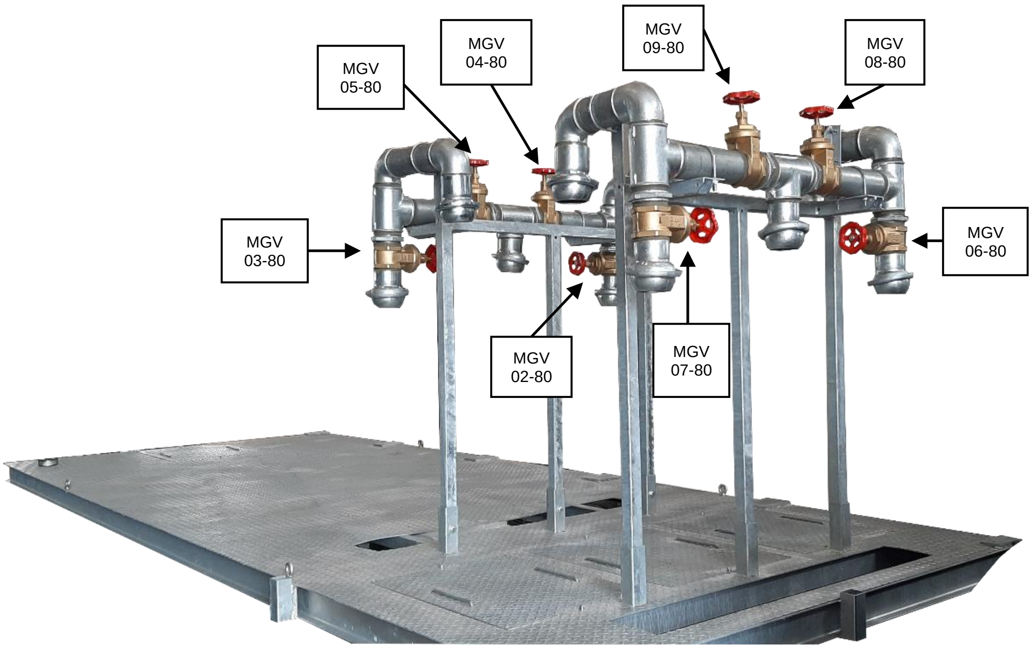
MAIN ELECTRICAL SUPPLY CABLE

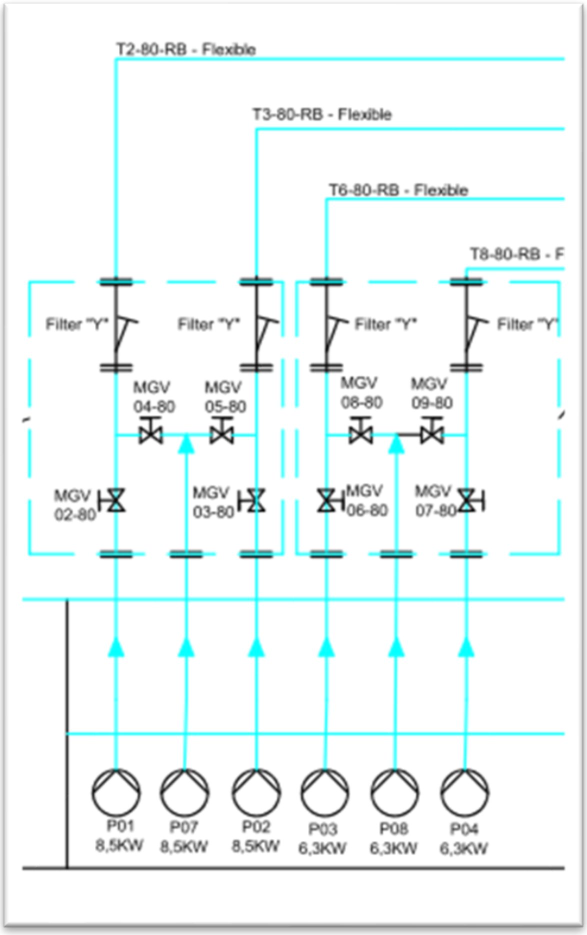
6. Check if all devices (pumps, mixers, sludge extractors) work properly (correct rotation of motors), otherwise invert electrical phases (U, V, W). Each operation must be performed by authorized and technically formed operator. System’s power supply must be protected by a circuit breaker.



Electrical phases of devices (for more details look at document A3403-Wiring Diagram)

7. Set all the parameter for the automatic washing cycle through the touch screen panel (for more details look at paragraph 3.2);
8. **Check the correct configuration of pressure washing pipes** (look at the point 3.2 – MANUAL PAGE to check which pumps are activated):


MGV
05-80
MGV
04-80
MGV
09-80
MGV
08-80
MGV
03-80
MGV
06-80
MGV
02-80
MGV
07-80

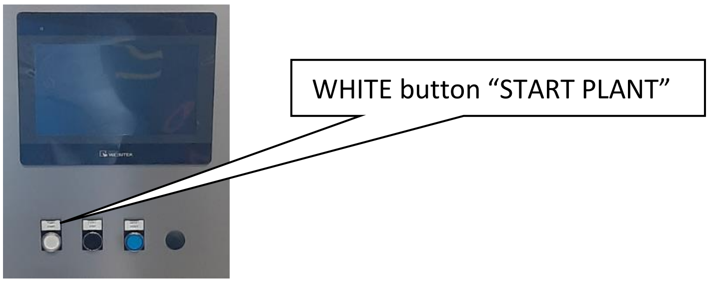

T2-80-RB - Flexible
T3-80-RB - Flexible
T6-80-RB - Flexible
T8-80-RB - F
Filter "Y"
Filter "Y"
Filter "Y"
Filter "Y"
MGV
04-80
MGV
05-80
MGV
08-80
MGV
09-80
MGV
02-80
MGV
03-80
MGV
06-80
MGV
07-80
P01
8,5KW
P07
8,5KW
P02
8,5KW
P03
6,3KW
P08
6,3KW
P04
6,3KW

Picture on the side: extract from document A0102-P&I-02

Follow the table below in order to check the right configuration of the MGV XX-80.

PUMPS ACTIVATED	CONFIGURATION OF VALVE							
	MGV 02-80	MGV 03-80	MGV 04-80	MGV 05-80	MGV 06-80	MGV 07-80	MGV 08-80	MGV 09-80
P1,P2,P3,P4	OPEN	OPEN	CLOSED	CLOSED	OPEN	OPEN	CLOSED	CLOSED
P1,P7,P3,P4	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN	CLOSED	CLOSED
P7,P2,P3,P4	CLOSED	OPEN	OPEN	CLOSED	OPEN	OPEN	CLOSED	CLOSED
P1,P2,P8,P4	OPEN	OPEN	CLOSED	CLOSED	CLOSED	OPEN	OPEN	CLOSED
P1,P2,P3,P8	OPEN	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED	OPEN
P7,P2,P8,P4	CLOSED	OPEN	OPEN	CLOSED	CLOSED	OPEN	OPEN	CLOSED
P7,P2,P3,P8	CLOSED	OPEN	OPEN	CLOSED	OPEN	CLOSED	CLOSED	OPEN
P1,P7,P8,P4	OPEN	CLOSED	CLOSED	OPEN	CLOSED	OPEN	OPEN	CLOSED
P1,P7,P3,P8	OPEN	CLOSED	CLOSED	OPEN	OPEN	CLOSED	CLOSED	OPEN

9. Once the system is correctly configurated, press **WHITE button "START"** to start automatic washing cycle, the system is now ready to work.



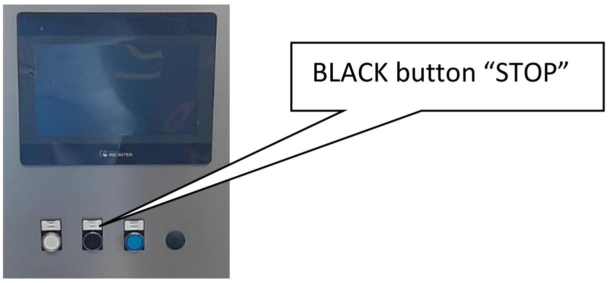
To switch off the system:

A. Automatically:

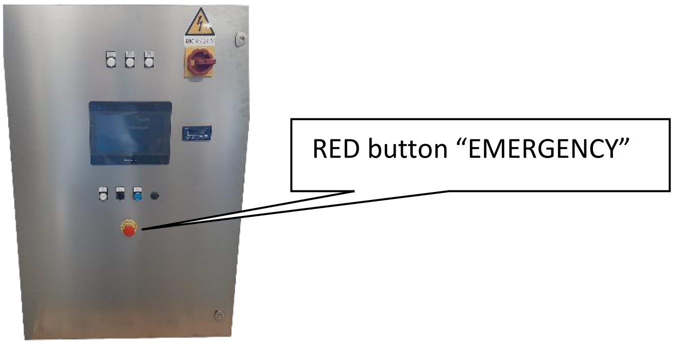
   - photocells or the timer on the PLC will switch off pumps to finish the washing. Plant is in stand-by mode.

B. Manually:

   - Press the **BLACK button "STOP"** to turn off the automatic washing cycle. System is off.



- Press the **RED button "EMERGENCY"** to turn off the system in all its parts.

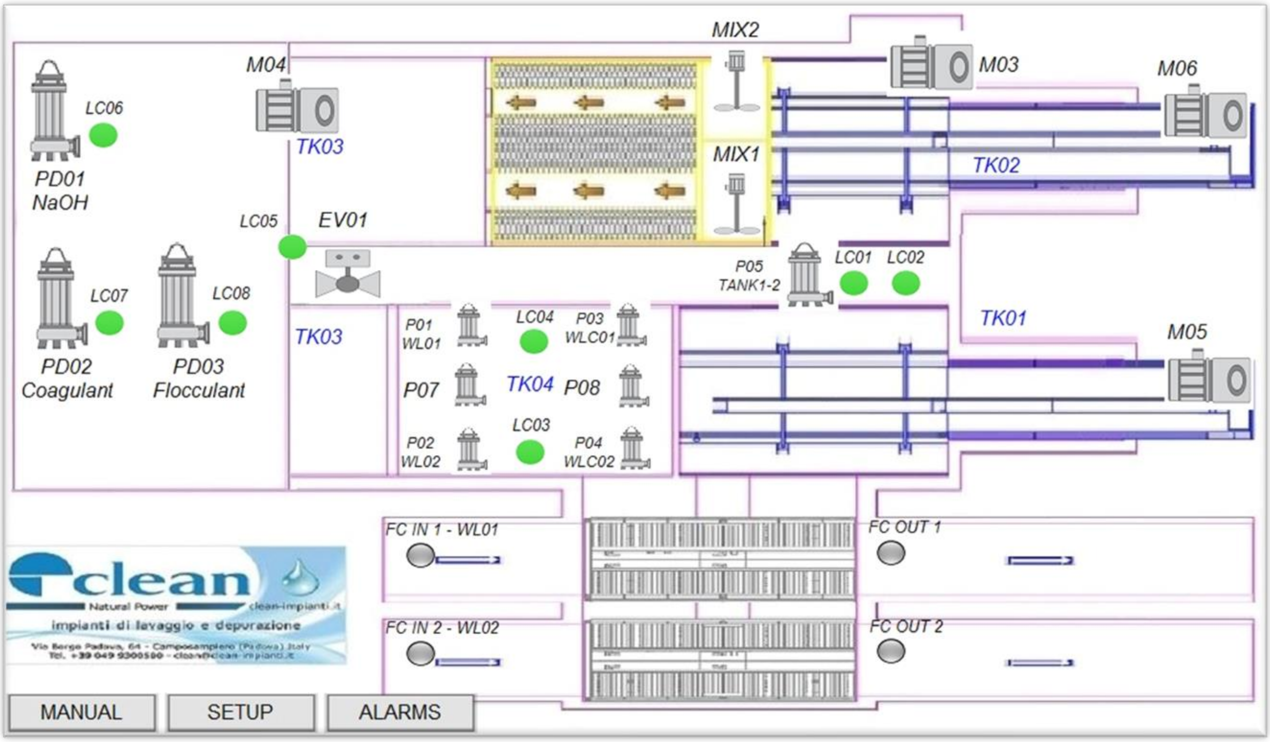


RED button "EMERGENCY"

Warning signs: it is strictly forbidden to enter on foot, with cycle, animals etc. ... The clean disclaims any responsibility to the non-compliance of these instructions.

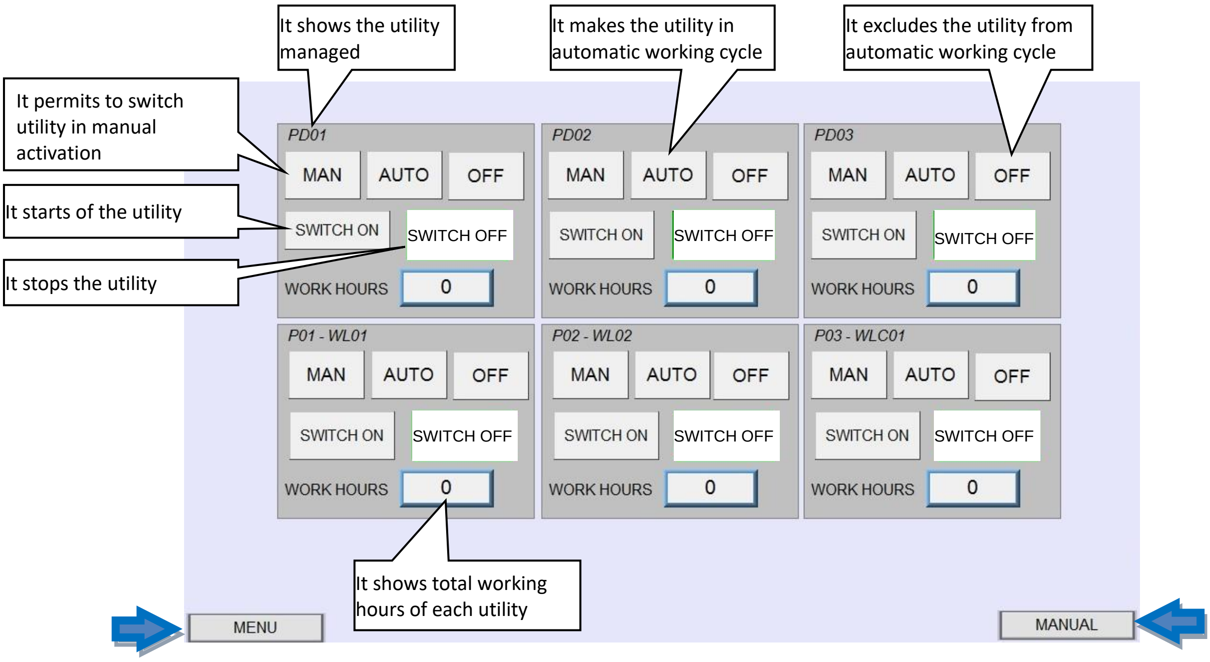
3.2. Operator’s touch screen panel

HOME PAGE: it shows status of the system: when utilities are **RED** they are in STAND-BY mode, when are **GREEN** they are working.


MIX2
M04
M03
M06
LC06
PD01
NaOH
TK03
MIX1
TK02
LC05
EV01
P05
TANK1-2
LC01
LC02
LC07
LC08
PD02
Coagulant
PD03
Flocculant
TK03
P01
WL01
LC04
P03
WLC01
TK01
M05
P07
TK04
P08
LC03
P02
WL02
P04
WLC02
FC IN 1 - WL01
FC OUT 1
FC IN 2 - WL02
FC OUT 2
clean
Natural Power
clean-impianti.it
impianti di lavaggio e depurazione
MANUAL
SETUP
ALARMS

HOME PAGE

MANUAL PAGE ***(3 pages)***: **Enable and disable (exclude) utilities in the automatic working cycle and permits to start and stop each utility manually (it’s necessary to “STOP” system with BLACK button – look at point B) at previous page).**


PD01
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
PD02
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
PD03
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P01 - WL01
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P02 - WL02
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P03 - WLC01
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
MENU
MANUAL

It shows the utility managed

It makes the utility in automatic working cycle

It excludes the utility from automatic working cycle

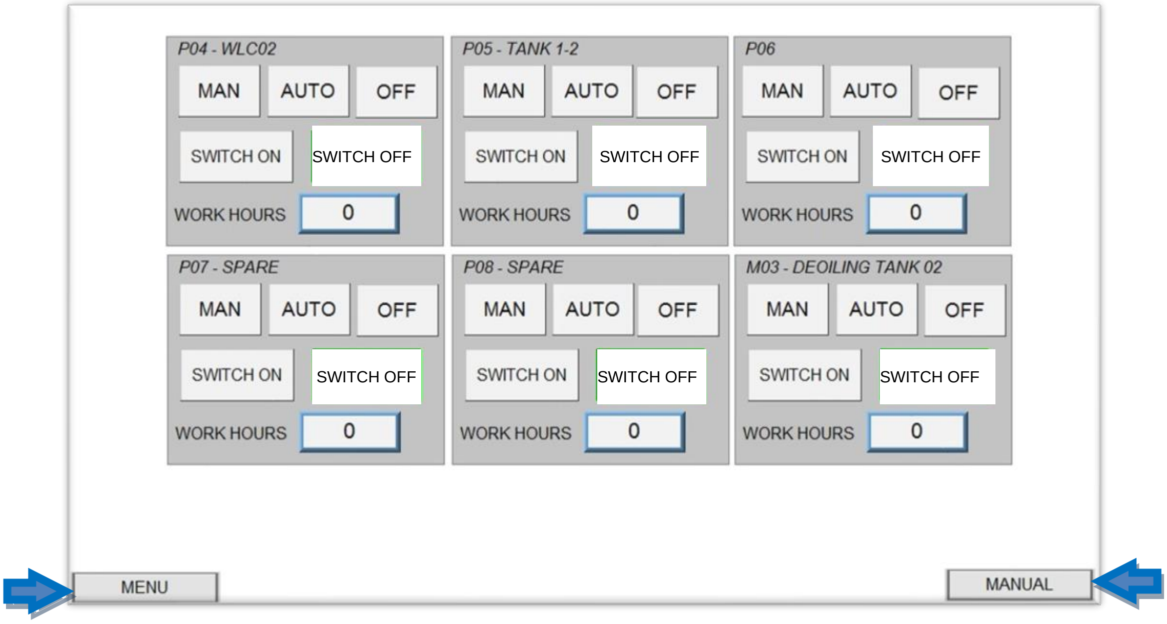
It permits to switch utility in manual activation

It starts of the utility

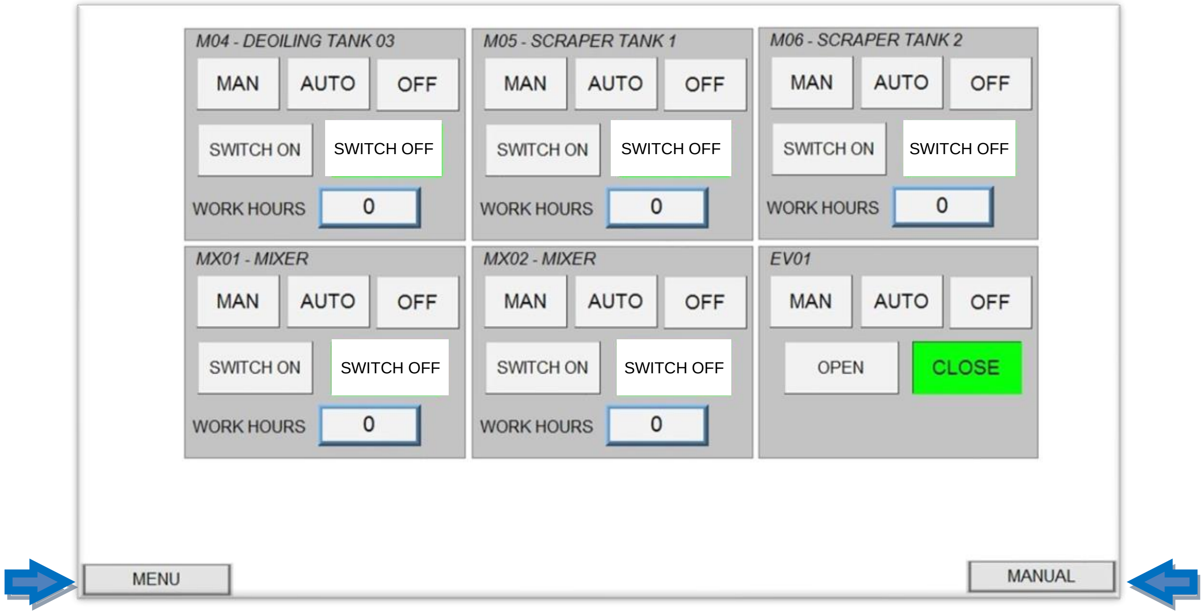
It stops the utility

It shows total working hours of each utility

Manual page - 1 of 3 (to change the page press “MANUAL” – to come back to home page press “MENU”)


P04 - WLC02
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P05 - TANK 1-2
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P06
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P07 - SPARE
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
P08 - SPARE
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
M03 - DEOILING TANK 02
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
MENU
MANUAL

Manual page - 2 of 3 (to change the page press "MANUAL" – to come back to home page press "MENU")


M04 - DEOILING TANK 03
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
M05 - SCRAPER TANK 1
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
M06 - SCRAPER TANK 2
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
MX01 - MIXER
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
MX02 - MIXER
MAN
AUTO
OFF
SWITCH ON
SWITCH OFF
WORK HOURS
0
EV01
MAN
AUTO
OFF
OPEN
CLOSE
MENU
MANUAL

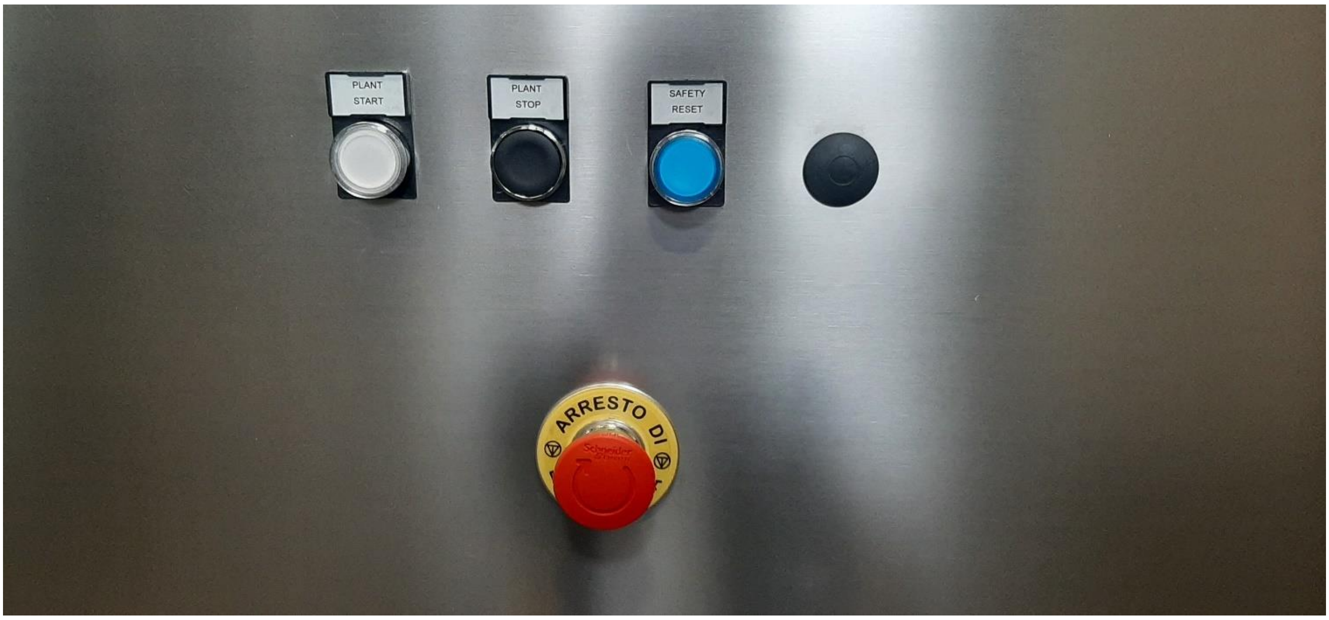
Manual page - 3 of 3 (to change the page press "MANUAL" – to come back to home page press "MENU")

- **"PD01 - DOSING – P09":** it enables/disables dosing pump (P09) for coagulant product;
- **"PD02 - DOSING – P10":** it enables/disables dosing pump (P10) for neutralizing product;
- **"PD03 - DOSING – P11":** it enables/disables dosing pump (P11) for flocculant product;
- **"P01 – WL01":** it enables/disables the washing pump of washing lane 01 (both bottom and side washing);
- **"P02 – WL02":** it enables/disables the washing pump of washing lane 02 (both bottom and side washing);

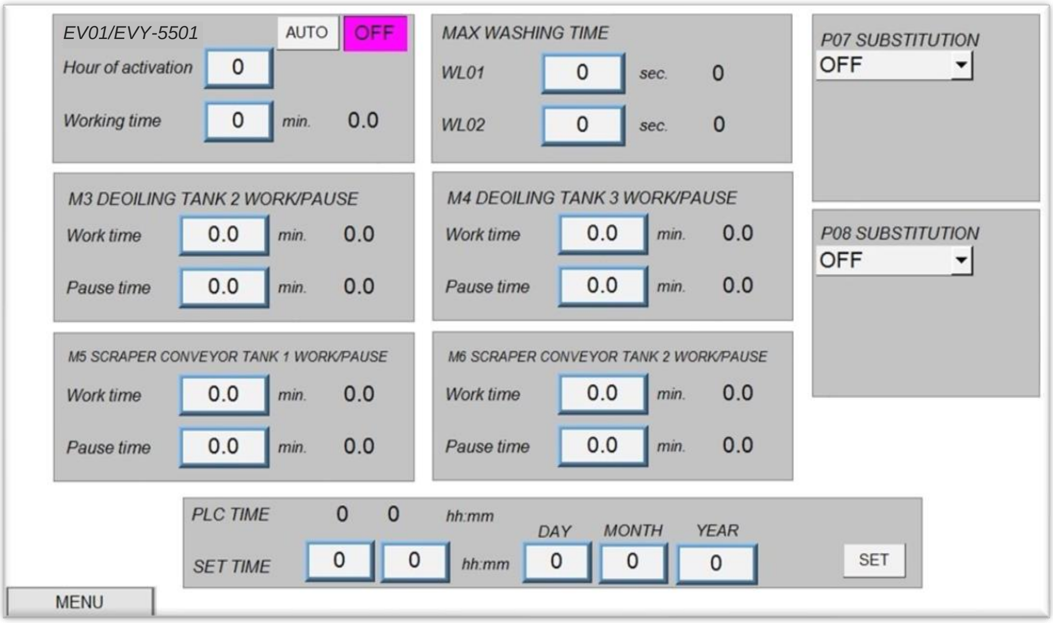
- **“P03 – WLC01”:** it enables/disables the washing pump of washing column of washing lane 01;
- **“P04 – WLC02”:** it enables/disables the washing pump of washing column of washing lane 02;
- **“P05 – TANK1-2”:** it enables/disables the pump that lift waste water from tank 01 to tank 02 (for proper working of the system this pump must be always activated);
- **“P07 – SPARE”:** it enables/disables the washing pump (spare) of washing lane 01 or 02. This pump has to be used as an alternative to the pump P01 or P02 and before enable this pump is necessary to operate on manual valve MGV (look at the table at page 42);
- **“P08 – SPARE”:** it enables/disables the washing pump (spare) of washing column of lane 01 or 02. This pump has to be used as an alternative to the pump P03 or P04 and before enable this pump is necessary to operate on manual valve MGV (look at the table at page 42);
- **“M03 - DEOILING”:** it enables/disables deoiling system M-03 installed into tank 02;
- **“M04 - DEOILING”:** it enables/disables deoiling system M-04 installed into tank 03;
- **“M05 - SCRAPER”:** it enables/disables scraper conveyor M-05 installed into tank 01;
- **“M06 - SCRAPER”:** it enables/disables scraper conveyor M-06 installed into tank 02;
- **“MX01 - MIXER”:** it enables/disables mixer MX-01;
- **“MX02 - MIXER”:** it enables/disables mixer MX-02;
- **“EV01/EVY-5501”:** it enables/disables solenoid valve for water make up into TANK 04

ATTENTION!!! When utilities woks in manual mode, every safety system is deactivated. Be careful to don’t let the pump work without water!

To repristinate automatic washing cycle, stop all utilities manually activated, then push “SAFETY RESET” (blue button) and then “START PLANT” (white button).



SETUP PAGE: it permits to set working/pause time of each utility and, in case that spare pump P07 or P08 has to be activate, to choose which washing lane will activate these pumps.



EV01/EVY-5501 AUTO OFF
Hour of activation 0
Working time 0 min. 0.0

MAX WASHING TIME
WL01 0 sec. 0
WL02 0 sec. 0

P07 SUBSTITUTION OFF

M3 DEOILING TANK 2 WORK/PAUSE
Work time 0.0 min. 0.0
Pause time 0.0 min. 0.0

M4 DEOILING TANK 3 WORK/PAUSE
Work time 0.0 min. 0.0
Pause time 0.0 min. 0.0

P08 SUBSTITUTION OFF

M5 SCRAPER CONVEYOR TANK 1 WORK/PAUSE
Work time 0.0 min. 0.0
Pause time 0.0 min. 0.0

M6 SCRAPER CONVEYOR TANK 2 WORK/PAUSE
Work time 0.0 min. 0.0
Pause time 0.0 min. 0.0

PLC TIME 0 0 hh:mm
SET TIME 0 0 hh:mm DAY 0 MONTH 0 YEAR 0 SET

MENU

EV01/EVY-5501: this is the solenoid valve that permits the make up of water into TANK 04 and it's managed by floating sensor LC05. It's possible to exclude this utility ("OFF") or to choose to make it working in automatic way ("AUTO"). In the case the valve is working in automatic way it's possible to choose **at what hour is possible to make it working ("hour of activation") and how long it has to work ("working time").** It's advisable to make it work during night (or when truck washing pit are not working) in order to correctly refill the water tank level into the system. In any case the valve will stop the water flow when level will reach the max level into TANK 04 or when working time is finished.

MAX WASHING TIME: it permits to set how long the washing lane (WL01 or WL02) has to work when activated from sensors (time is in seconds and it's advisable to set time between 30 and 60 seconds).

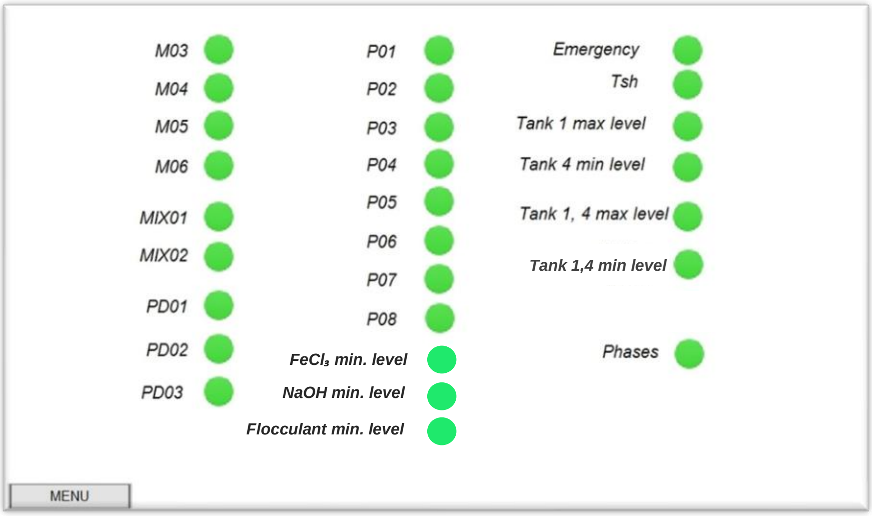
M03/M04 - DEOILING: it permits to set how long the deoiling system (M03 or M04) has to work and how long it has to be in stand-by mode (time is in minutes). Working time has to be calibrate during commissioning or in the first weeks of work in order to understand how much oil/hydrocarbons floating on the water surface are present and how long the system takes to remove them.

M05/M06 – SCRAPER CONVEYOR: it permits to set how long the sludge removal system (M05 or M06) has to work and how long it has to be in stand-by mode (time is in minutes). Working time has to be calibrate during commissioning or in the first weeks of work in order to understand how much sludge/sand will settled into TANK 01 and TANK 02. It's advisable to make them work between 10 and 15 minutes (work time) every 50/60 minutes (Pause time).

P07/P08 SUBSTITUTION: it permits, for each pump, to choose which washing lane will activate the same. If "OFF" is selected the pumps don't work, if "WL01" is selected for P07, it will start when the truck will approach to washing lane WL01 and so on.

VERY IMPORTANT: before activate spare pumps it's necessary (must) to change configuration of washing pipe on the walkway (look at paragraph 3.1 point 8 – page 41).

ALARM PAGE: it shows active alarms



When green circle 🟢 becomes red 🔴 it means that some alarm occurred.

ACTIVE ALARM	DEVICE	PROBLEM	POTENTIAL SOLUTION	OTHER SOLUTIONS
M03-M04	Deoiling systems	Thermal protection intervened	- Look if oil colector rope is in the right position on the wheels and restart thermal protection into control panel; (look at the specific manual)	Change the gearmotor
M05-M06	Chain conveyor - Sludge removal systems	Thermal protection intervened	- try to understand if there is too much mud settled into the tank and if it is, empty the tank, remove it manually and restart the thermal protection, the system should restart; - check if the chain is locked just after the driving wheel and, if it is, try to unlocked it (will be necessary to change the antiseizure part of the conveyor)	Change the gearmotor
MIX01-MIX02	Mixing systems	Thermal protection intervened	- check if the shaft of the system is locked by some body or from mud and, if it is, unlocked it and restart the thermal protection, the system should restart.	Change the gearmotor
P01 to P08	Washing pumps	Thermal protection intervened	- remove pump from the tank and check if pressure pipe it's clogged or some body stops the pump's impeller; (look at the specific manual)	Change/repair the pump (look at specific manual)
PD01 to PD03	Dosing pumps	Thermal protection intervened	- check if the pressure pipe is clogged and try to restart the thermal protection. (look at the specific manual)	Change/repair the pump (look at specific manual)
Chemicals min. level	Chemicals products	Minimum level into the storage tank	- make up the chemical (in any case the wheel washing system will continue to work even without chemicals but clarification of water will be worse).	
Emergency	Whole system	Alarm manually activated	- Check which problem accurred, solve it and reset the system.	

ACTIVE ALARM	DEVICE	PROBLEM	POTENTIAL SOLUTION	OTHER SOLUTIONS
Tsh	Cointainer with control panel	Temperature too high into the same – the system will stop working	• wait lower temperature or try to refresh the container.	
Tank 01 Max level	Tank 01	Level into the tank is too high. If this alarm is on the washing cycle doesn't work.	• if pump P05 is active it means that water treatment system is still working and it's only necessary to wait that P05 will empty the tank 01 and water comes back to tank 04.	
Tank 01, 04 Max level	Tank 01 Tank 04	Level into both tanks is too high. If this alarm is on the washing cycle doesn't work.	• It is necessary to manually empty tank 01 (use P06 loose pump);	
Tank 01, 04 Min level	Tank 01 Tank 04	Level into both tanks is too low. If this alarm is on the washing cycle doesn't work.	• It is necessary to manually make up water into tank 04 activating **EV01/EVY-5501** (look at "MANUAL PAGE" – PAGE 44-45);	
Tank 04 Min level	Tank 04	Level into tank 04 is too low. If this alarm is on the washing cycle doesn't work.	• if pump P05 is active it means that water treatment system is still working and it's only necessary to wait that P05 will empty the tank 01 and water comes back to tank 04. • if pump P05 is not working it is necessary to manually make up water into tank 04 activating **EV01/EVY-5501** (look at "MANUAL PAGE" – PAGE 44-45);	
Phases	Electrical control panel	Main electrical connection from the grid is not correctly connected	• Reverse the order of the phases	

3.3. Proper use for a correct wheel washing

Wheel washing lane is equipped with fixed nozzles and it means that in order to clean the complete circumference of the wheel the same has to rotate inside the system thus the vehicle has to proceed inside the lane.

To obtain a good result of cleaning is necessary that truck approaches the washing lane slowly. When the truck is at around 2-3 meter from the entry of the washing lane, optical sensor detects it and starts the system. Before entering the system is necessary to wait the complete pressurization of the pipes. Once the system is ready the truck has to go throught the lane at very slow speed and if necessary make some stops in order to permit to the system to remove all sediments on the wheels. In case that only one passage throught the system obtains not a good result is necessary to repeat the operation.

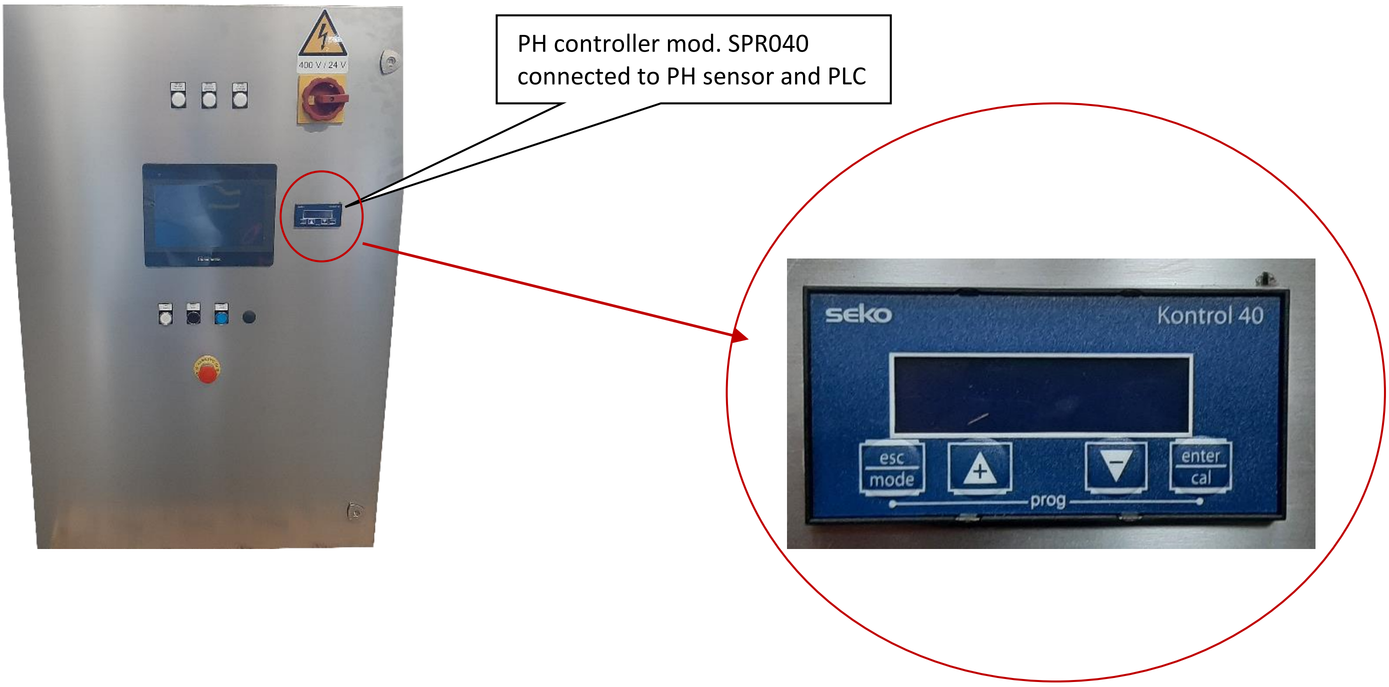
ATTENTION: Before entering the system assure that all the windows are closed. No people or animals are admitted into the washing lane.

3.4. Proper use for a correct waste water clarification

Chemical products dosage

Waste water that comes from washing lane will be polluted mainly with stones, sand and coke powder. Main part of sand and stones will be removed into tank 01 and, thanks to scraper conveyor, extracted from the tank. Coke powder is more difficult to remove and in order to do it the treatment involves addition of some chemicals (coagulant, neutralizer and flocculant).

Each chemical product is added into the treatment cycle thanks to dedicated dosing pump. Dosage of neutralizing product is automatic thanks to PH sensor and controller installed and already set from Clean Srl (for more detail about configuration look at user manual of the PH controller on the following pages).


PH controller mod. SPR040
connected to PH sensor and PLC

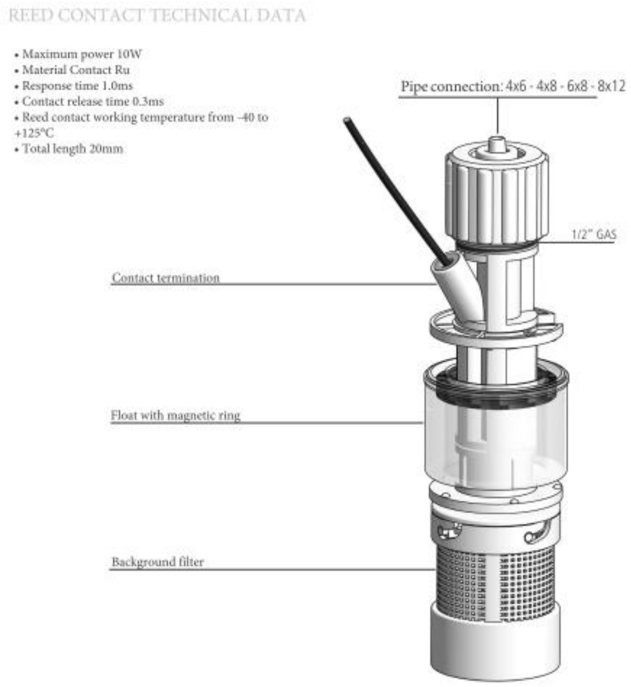
Dosage of both coagulant product ($FeCl_3$) and flocculant product (Anionic polyelectrolyte) has to be regulated during the commissioning. **Quantity of product added to the treatment has to be enough to reach clarified water at the end of the treatment process.**

In the next paragraph is better described the dosing of each chemical product.

Storage and dosage of coagulant product ($FeCl_3$): Ferric chloride is available in a 40% ready-made commercial solution. Alternatively, lower concentration products are available.

The chemical reagent is decanted into the storage tank with the anti-spreading tank supplied by Clean Srl and located into cooled container.

The tank supplied by Clean is even equipped with a minimum level sensor, integrated into the suction filter (picture below). This level sensor (LC06) stops dosing in case of product absence and displays an alarm.



REED CONTACT TECHNICAL DATA

- Maximum power 10W
- Material Contact Ru
- Response time 1.0ms
- Contact release time 0.3ms
- Reed contact working temperature from -40 to +125°C
- Total length 20mm

Ferric chloride is dosed by a dedicated dosing pump.

The dosage of this product starts when the pump (P05) starts the transfer of water from the sand removal TANK 01 to the mixing system located into TANK 02.

The amount of coagulant to be determined empirically during the start-up phase of the plant, as the ideal amount depends on the solid flow.

Being a closed loop water treatment system, it is advisable not to carry out very high dosages.

If the water remains cloudy and the purifier has a low yield, the dosage should be increased; If the water becomes yellowish and soda consumption increases a lot, the dosage is excessive and should be decreased.

Following changes in the coagulant dosage, it is recommended in parallel to verify and adjust the dosage of flocculant.

The amount of product injected by the pump is manually adjusted, then the volume and number of injections per minute remains constant. The adjustments can be made by acting on the dosing pump: in this regard, please refer to the specific user manual at the next pages.

Storage and dosage of flocculant product (Anionic polyelectrolyte): Flocculant is available in ready-made concentrated trading solutions, with titles up to 67%.

If the dosages are difficult to manage, it will be necessary to provide for the installation of a polypreparator to carry out the dilutions, as the manual and uncontrolled addition of water to the concentrated solution of flocculant causes the formation of solid blocks, which make it unusable: the preparation of a dilution must take place with the appropriate technology.

The dosing pump installed allows the injection of high viscosity products.

The chemical reagent is decanted into the storage tank with the anti-spreading tank supplied by Clean Srl and located into cooled container.

The tank is equipped with a minimum floating level sensor (picture below). This level sensor (LC08) stops dosing in case of product absence and displays an alarm.

The flocculant is dosed by a dedicated dosing pump.
The dosage of this product starts when the pump (P05) starts the transfer of water from the sand removal TANK 01 to the mixing system located into TANK 02.

The amount of flocculant to be measured must be determined empirically when the plant is set up, as the ideal quantity depends on the solid flow.
Being a closed loop water treatment system, it is advisable not to carry out very high dosages.

If the water remains cloudy and the purifier has a low yield, the dosage should be increased; if white patina forms on the surface of the water, the dosage is excessive and should be decreased; If the newly injected flocculant solidifies and does not disperse, it is necessary either to change product or install a polypreparer.

Following changes in the dosage of the flocculant, it is recommended in parallel the verification and adjustment of the coagulant dosage.

The amount of product injected by the pump is manually adjusted, then the volume and number of injections per minute remains constant. The adjustments can be made by acting on the dosing pump: in this regard, please refer to the specific user manual.

Storage and dosage of neutralizing product and PH adjustment (NaOH): Soda is used to avoid the acidification of water that would result from the dosage of $FeCl_3$, which in water forms ferric hydroxide and hydrochloric acid.
Soda is available in ready-made commercial solutions in several concentrations. It is not advisable to choose very concentrated solutions, to avoid overdoses: solutions with a title between 20 % and 30 % are recommended.

The chemical reagent is decanted into the storage tank with the anti-spreading tank supplied by Clean Srl and located into cooled container.

The tank supplied by Clean is even equipped with a minimum level sensor, integrated into the suction filter (sensor is the same as for coagulant product). This level sensor (LC07) stops dosing in case of product absence and displays an alarm.

The soda is dosed by a dedicated dosing pump.

Dosing volumes are determined by the pH meter, which is set to keep the pH of the water in a neutral range.
The instrument is installed in the electrical panel and the pH probe is immersed in the mixing tank.

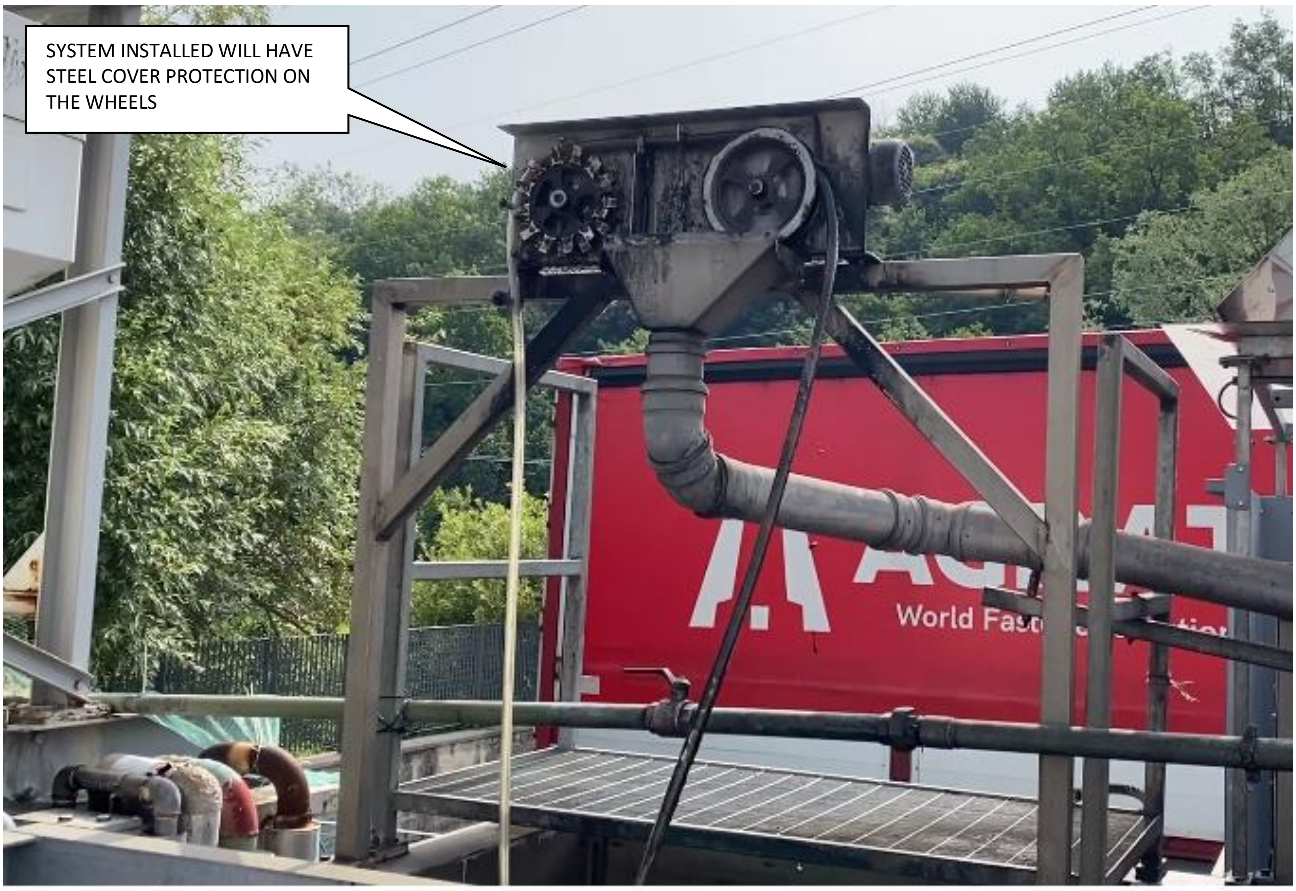
Through the regulation tool (or PLC), it is possible to adjust the two SET-POINTS that regulate the start and stop of the dosing pump (set points are already set by Clean Srl), which must operate in proportional mode to the probe signal.

The pH value at which the start-up of the dosing pump is set (SET_POINT 1) is pH=6; the value at which the pump stops is set is pH=8.

These values could be subsequently modified: in this regard, please refer to the specific user manual.

Generally, no adjustments need to be made on the dosing pump unless it is noted that the volume of product dosed with a single injection causes excessive pH variations and the measured value fluctuates excessively (e.g. by one pH unit or more). In this case, reduce the volume injected with a single injection by acting on the dosing pumps: in this regard, please refer to the specific user manual.

Deoiling system – Oil Skimmer


SYSTEM INSTALLED WILL HAVE STEEL COVER PROTECTION ON THE WHEELS

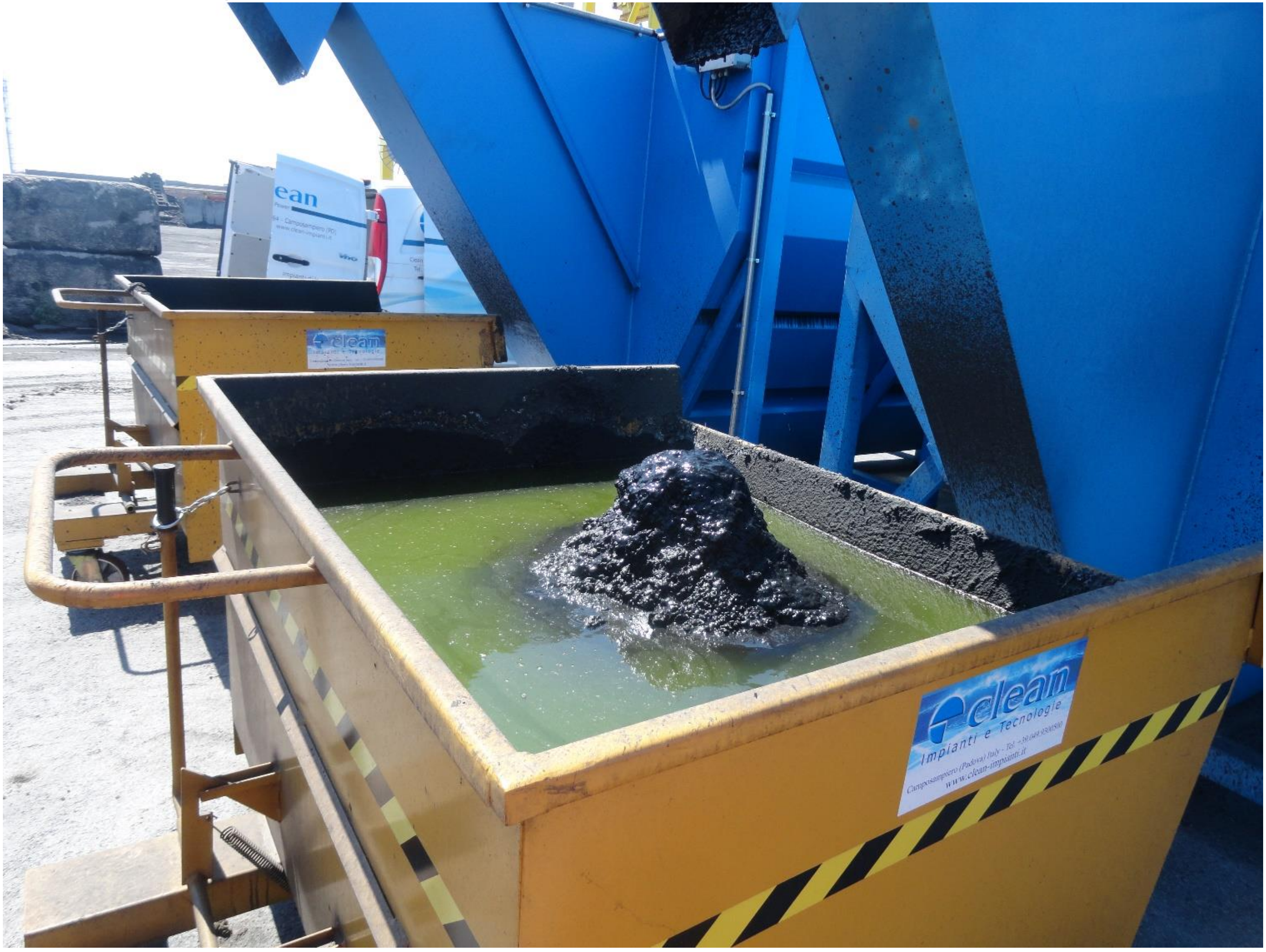
Aim of this system is to remove oil or greases that are floating on the water surface. On your plant are installed two of these systems and activation can be managed through touch screen panel in order to choose how many minutes they have to work and how many minutes they have to be in stand -by mode (see pag.43 and 44 of this manual) . This can be correctly set only during start-up of the system and adjusted on the base of how much “material” is accumulated on water surface (for more details look at dedicated manual in the following pages).

The Oil Skimmer model S 100 is designed to remove floating oil and fat from water, emulsions, washing water or waste water. The floating oil and fat sticks to the outside of the free-floating flexible oil collector tube. The oily oil collector tube is drawn into the oil skimmer. Ceramic scrapers remove the oil from the surface of the oil collector tube. The clean oil collector tube returns to the water surface and picks up new oil or fat. The oil, that is removed from the oil collector tube floats into the oil collector pan of the oil skimmer and from there into a PE storage tank of 100 liters capacity. It’s very important to daily/weekly check the level of material inside the storage tank and, if necessary, empty tank and dispose the material according to law regulations.

Sludge extractor (scraper conveyor)

Aim of this system is to remove sediment settled into TANK 01 and TANK 02. On your plant are installed two of these systems and activation can be managed through touch screen panel in order to choose how many minutes they have to work and how many minutes they have to be in stand -by mode (see pag.43 and 44 of this manual). This can be correctly set only across the using of the system and adjusted on the base of how much “material” is settled into the respective tanks.

Material removed from scraper is low in concentration of solid (around 5-6%) and it means that could be better to increase concentration providing draining big bag with storage tank to recover water drained to send again into the water treatment system.



Material removed from these system goes into storage tanks (at charge and care of the customer), it’s very important to daily check the level of material inside the storage tank and, if necessary, empty tank and dispose the material according to law regulations.

3.5. Maintenance of the system

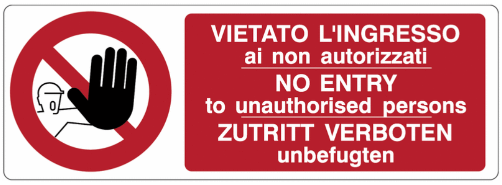
To keep the system at a good standard of efficiency and safety, it is indispensable to carry out periodic checks.

For maintenance and for all repair operations**, it is necessary to have knowledge of all the safety standards**. Consult staff with specific skills of the equipment in question.

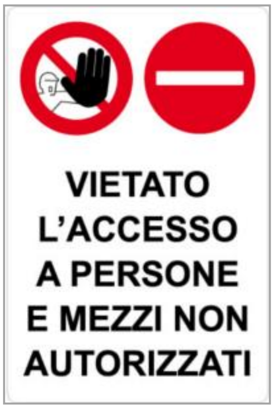
Whenever performing a maintenance, *disconnect the system from the power supply, and ensure that the plant cannot operate accidentally/automatically*.

Frequency	Activity
Weekly	➡ Check the amount of settled sludge into the TANKS 01 and 02 and eventually increase/decrease working time of **scrapers**. Unremoved mud increases the degree of pollution of water and consequently the washing does not fall within the required parameters. An excessive and uncontrolled accumulation of mud, especially if composed of heavy and encrusting particles, may damage the gearmotor of the scraper conveyor. ➡ Check the amount of oil/greases on the water surface of the TANKS 01 and 03 and eventually increase/decrease working time of **deoiling system**. ➡ Clean **optical sensors** from dust and check the correct functioning of the same. ➡ Check the situation of the **waste water discharging channel** (concrete platform) and verify that no sediments that could limit water flow. In case the channel is not clean from sediments provide to clean it. ➡ Check the situation of sediment accumulated into the **tank below the washing lane** and, if necessary clean it. ➡ Check the situation of **"Y" filters** installed on pressure pipes of washing pumps. If, reading the two pressure gauges installed on the filter the spread between first one and second one is more than 0,2 bar, proceed to clean it (for more detail look at documentation in the following pages). ➡ Check the **level of chemical products** inside storage tanks located into cooled container and, if necessary, refill the tanks. ➡ Check the operation of the **oil collector tube**; ➡ Check the **drain of oil** removed from the oil collector tube and, if necessary clean the draining pipe; ➡ Activate the washing system and check if, in general, it works properly.
Every month	➡ Check and clean, if necessary the driving wheel of scraper conveyors. ➡ Remove the safety hood and clean the oil skimmer. ➡ Check the scrapers of oil skimmer, the oil collector and the ceramic fingers whether they are worn out or cracked (for more details look at manual on the next pages).
At least once a year	➡ If spray nozzles are clogged, unscrew and clean them. ➡ Check the quality of water of the complete system, the mud settled into TANK 03, cleaning of lamella pack and, if necessary, discharge the water of the system, proceed with cleaning of all components and refill the system with clean water. ➡ Check the situation of oil collector tube and if necessary proceed to replace it (for more details please look at the manual on the next pages).
ATTENTION: Before servicing any parts of the systems watch the safety instructions in this manual !!!	

WARNING: cannot transit lowered vehicles and / or special vehicles. The vehicle chassis can touch the top of the ramps.


VIETATO L'INGRESSO
ai non autorizzati
NO ENTRY
to unauthorised persons
ZUTRITT VERBOTEN
unbefugten

IMPORTANT


VIETATO
L'ACCESSO
A PERSONE
E MEZZI NON
AUTORIZZATI

Every time you enter in the plant:

- **Close the windows of vehicles.**
- **Maintain a speed slower than 3 km/h. When the wheels are too dirty, make some stops to allow the nozzle to remove dirt from the tires.**
- **The wheels of the vehicles must be absolutely clean as not to soil and pollute the external environments and wheels of vehicles already cleaned.**

4. Generic malfunction of complete system

4.1. Troubleshooting of the pumps

The table below gives some tips in case of appearance of some drawbacks.

The pump does not start

Probably cause

a) No power supply to the network.
b) Overload protection previously tripped.
c) lack of water into clarified water tank (level has to be minimum 50 cm).
d) floating sensor broken or stuck in wrong position (thus it seems that there is no water inside the tank).

Possible remedies

a) Provide power supply.
b) Reset the protection (if it intervenes again see inconvenience "The pump vibrates and has a noisy behaviour”.
c) refill clean water into the tank.
d) tests proper working of sensor or disengage floating sensor.

The pump does not deliver or delivers capacity reduced or irregular

Probably cause

a) pipe clogged or stuck valve.
b) Pump not primed for failure to fill or faulty sealing of the suction pipe of the foot valve (Note that the mechanical seal may have suffered serious damage).
c) Difference in height and / or pressure drop in suction too high.
d) Wrong direction of rotation.
e) Air in the suction pipe or in the pump.

Possible remedies

a) Remove and clean or replace.
b) Fill the pump with liquid after checking the perfect seal of the suction pipe, the valve and the integrity of the mechanical seal.
c) Decrease the altitude or use a pipe with a diameter greater or unclogging the foot valve.
d) Change over two-wire power terminal.
e) Release air

The pump has a vibration and has a behaviour of noisy

Probably cause

a) The pump works in cavitation.
b) Motor bearings or support worn.
c) Foreign bodies between fixed and rotating parts of the pump.
d) ROTATION WRONG

Possible remedies

a) Partitioned the scope.
b) Replace bearings.
c) Clean.
d) CHANGE PHASE ELECTRIC.

The pump turns to the contrary when you stop

probable cause

a) Leakage in suction pipe.
b) Foot valve or check valve faulty.
c) Air in the suction pipe.

Possible remedies

a) Repair or replace the suction pipe.
b) Replace the valve.
c) Release air.

For more details about problem/solution please refer to the specific manual in the following pages.

4.2. Troubleshooting of the deoliling system/oil skimmer

The oil skimmer removes no oil

-Check whether there is oil on the water surface.

-Check whether the floating oil sticks to the oil collector tube and whether the tube brings the oil to the oil skimmer.

-If the oil is not remove from the oil collector tube check and replace the scrapers and the oil collector tube.

-Check whether the drain is blocked and clean if necessary.

The amount of water in the skimmed oil is to high

-Check whether there is enough oil on the water surface (>0,2 mm). Reduce the operating time of the skimmer by a timer.

-Use the FRIESS decanter. With the decanter you can eliminate water that is collected by the oil skimmer.

After starting the drive wheel or the pulley wheel does not turn

-Switch of the oil skimmer and check by turning of the fan at the motor, whether the motor shaft is blocked or not.

-Start the oil skimmer and check whether the motor shaft turns, if the motor turns and the drive wheel or the pulley wheel not, the gear is damaged and has to be replaced.

Drive wheel and pulley wheel turn, but the oil collector tube does not move

-Check whether the motors turn the right way

-Check the oil collector tube whether it`s worn out

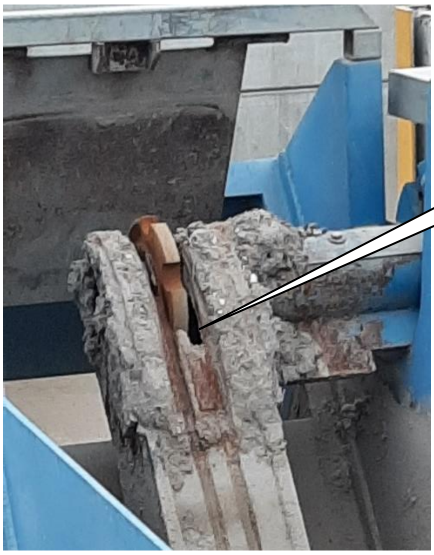
-Check the ceramic fingers of the drive wheel, whether they are worn out

-Check the correct place of the ceramic cylinder. See attached drawing in the specific manual on next pages.
The ceramic cylinder (A) has to be mounted as far away as possible from the drive wheel; the ceramic cylinder (B) has to be mounted as near as possible towards the drive wheel.
For more details about problem/solution please refer to the specific manual in the following pages.

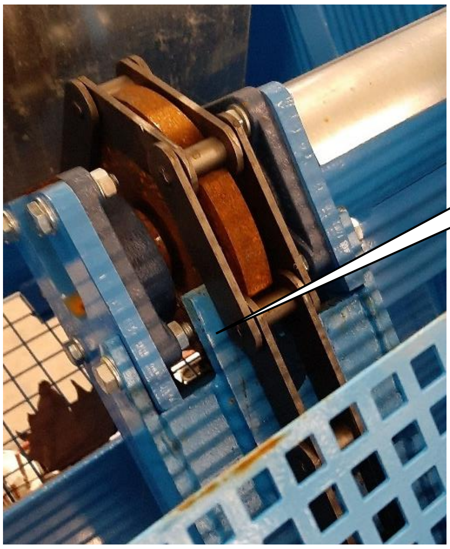
4.3. Troubleshooting of the sludge removal/scraper conveyor

The scrapers remove no enough sludge from tanks and there is too much water into storage tank
-Check whether there is enough sludge on the bottom of the tank. Reduce the operating time of the conveyor by a timer and make longer stand-by time.

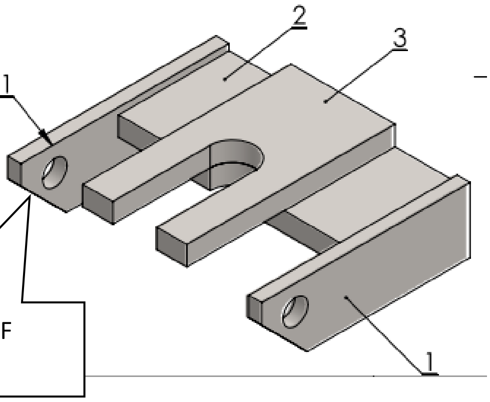
The motor overloads protection.
-Check whether there is too much sludge on the bottom of the tank. If necessary, empty the tank and remove the sludge. Keep the same operating time of the conveyor by a timer but reduce stand-by time.
-Check if chain antiseizure part is weared and, if necessary, change it. Weared part creates the blocking of the chain and thermal protection of the motor will operate.



ANTISEIZURE PART WEARED



ANTISEIZURE PART NEW



PARTS TO BE REPLACED IF WEARED

The information in this chapter ARE NOT INTENDED TO OPERATOR, BUT ONLY PROFESSIONALLY QUALIFIED PERSONNEL able to perform them.

IMPORTANT

The execution of the repair and maintenance operations, ASSUMED THE NEED KNOWLEDGE OF ALL SAFETY RULES. IS MANDATORY SO LOOK TO SKILLED AND KNOWLEDGE WITH SPECIFIC EQUIPMENT. CAUTION NO REASONABLE APPLICABLE WILL 'BE OMITTED IN THE INTEREST OF SAFETY.

Clean® S.r.l.

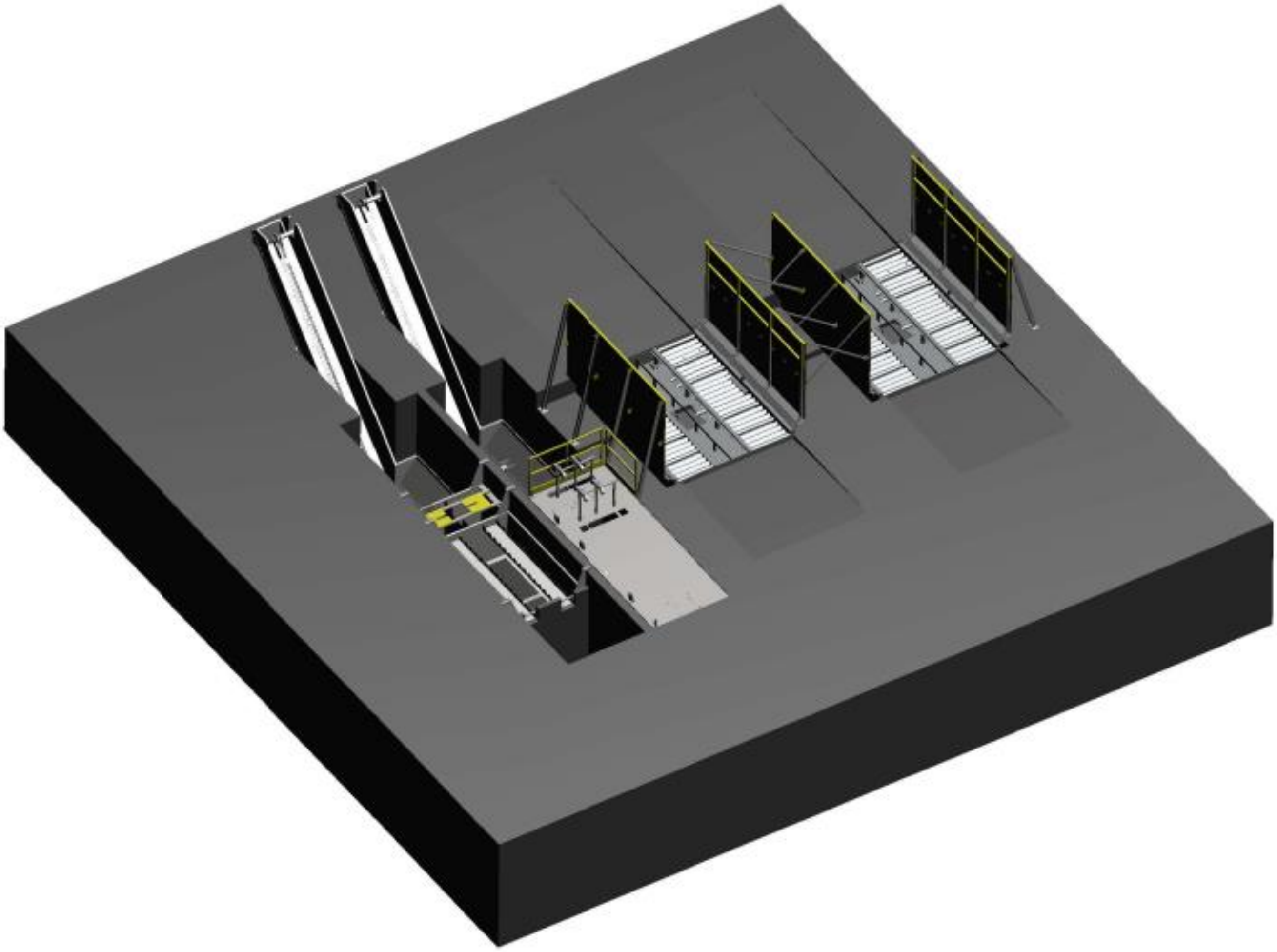
5. Technical data of the complete system

5.1. Complete plant general data

It shows the data concerning the characteristics and performance of the complete system.

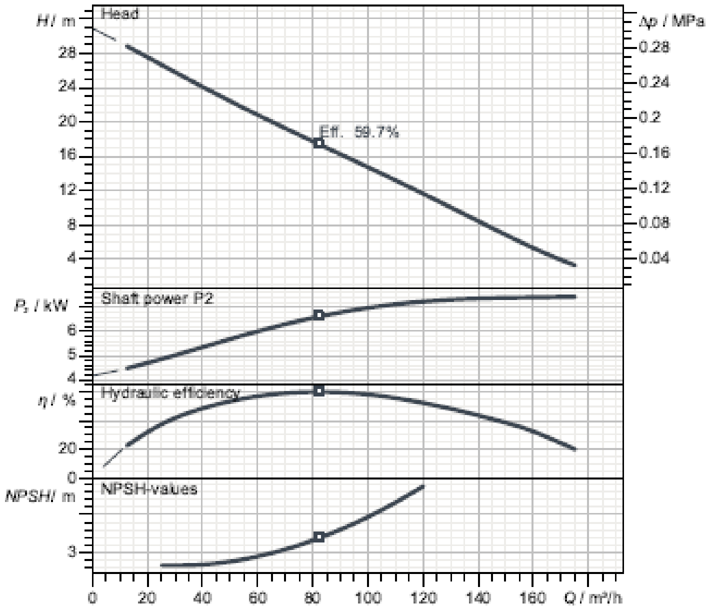
Type: Wheel Washing System

- **Model**: 2X400C.VTCF30 (TAYLORED)
- **Serial number**: **PF 5987**
- **Total requested power:** ≈ 40 kW
- **Voltage/Frequency:** 3P+N+PE – 400V – 50HZ
- **Total water flow of washing lane (both activated):** ≈ 6.000 l/min.
- **Waste Water flow treatment capacity:** ≈ 500 l/min.
- **Maximum water pressure:** 3 bar

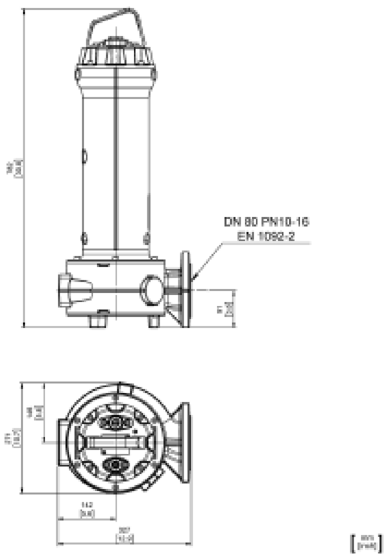


5.2. Washing pump’s technical data (P01-P02-P07)

Technical specification



Characteristic curves according to UNI EN ISO 9906:2012
P2< 10kW: paragraph 4.4.2
10kW<P2<100kW: Grade 3B
P2> 100kW: Grade 2B



Pump

Series	GREY series
Pump name	DRG 1000/2/80 B0FT5
Configuration	NGTSB51040N00NN
Standard	CE

Operating limits (standard pumps)

Max. ambient temperature	40 °C
Max. density treated liquid	1100 kg/m³
pH treated liquid	6 ÷ 14
Max. start per hour (equally distributed)	30
Wet/dry use	WET
Max. acoustic pressure level	70 dB
Operating mode	S1 - Continuous use

Construction materials

Case	Cast iron EN-GJL 250
Shaft	Stainless steel AISI 431
Hydraulic	Cast iron EN-GJL 250
Impeller	Cast iron EN-GJL 250
Painting/Coating	Bi-epoxy 200 µm sea water
Screws	Stainless steel - Class A2-70
Gaskets	NBR

Motor data

Rated voltage	400 V
Frequency	50 Hz
Motor phases	3~
Number of poles	2
Rated power P2	7.50 kW
Incoming power P1	8.51 kW
Rated current	13.7 A
rpm	2873 1/min
Efficiency	88.1 %
cos φ	0.894
Rated torque	24.9 Nm
Start	Direct starting
Starting current	92.1 A
Degree of protection	IP 68
Insulation class	H
Capacitor	
Starting Capacitor	

Construction features

Cooling system	No cooling jacket
Main cable	4G1,5 + 3x1
Cable length	10 mt
Mechanical seals	2 in silicon carbide (2SiC)
Additional drilling	-
Weight*	79.2 kg
Electrical variant	Thermal protection and leakage sensor

* cable and fixing system excluded

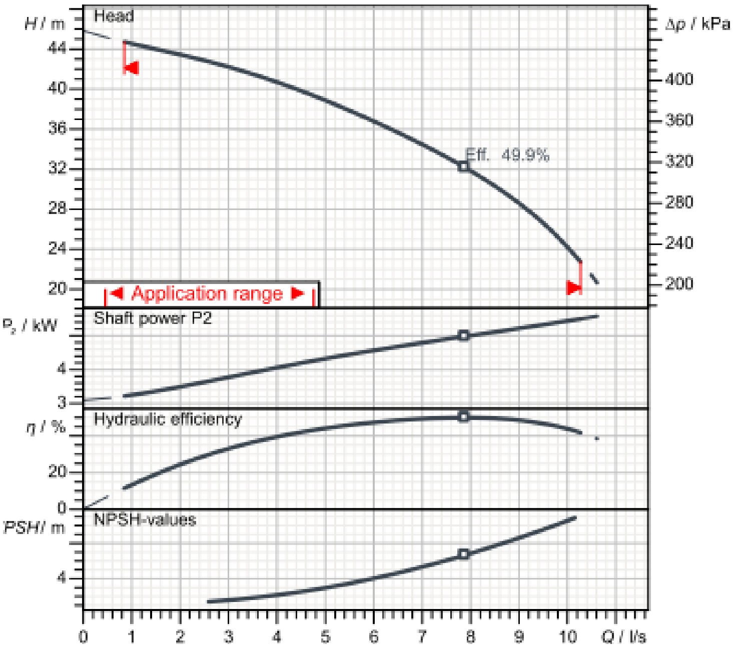
Hydraulic

Free passage	55 x 50 mm
Impeller type	Open channel impeller
Max. hydraulic efficiency	59.7 %
Suction	DN 80 UNDRILLED
Discharge	DN 80 EN 1092-2

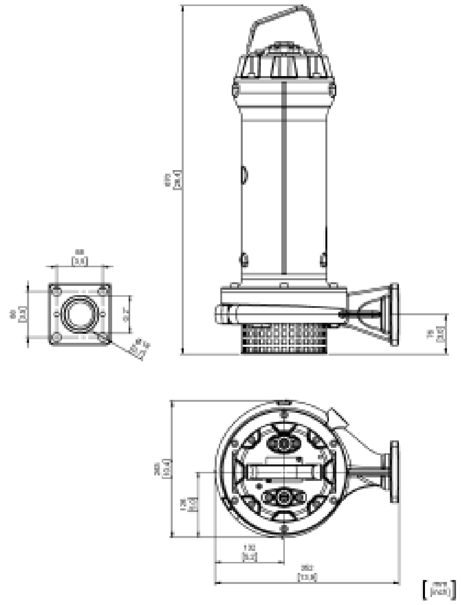
5.3. Washing pump’s technical data (P03-P04-P08)

Technical specification

3~ 50 Hz



Characteristic curves according to UNI EN ISO 9906:2012
P2<10kW: paragraph 4.4.2
10kW<P2<100kW: Grade 3B
P2>100kW: Grade 2B



Pump

Series	GREY series
Type	APG 750/2/G50H A0FT5
Version	TS 10 400D NN NN GG
Standard	CE

Operating limits (standard pumps)

Max. ambient temperature	40 °C
Max. density treated liquid	1100 kg/m³
pH treated liquid	6 ÷ 14
Max. start per hour (equally distributed)	30
Wet/dry use	WET
Max. acoustic pressure level	70 dB
Operating mode	S1 - Continuous use

Construction materials

Case	Cast iron EN-GJL 250
Shaft	Stainless steel AISI 431
Hydraulic	Cast iron EN-GJL 250
Impeller	Cast iron EN-GJL 250
Painting/Coating	Bi-epoxy 200 μm sea water
Screws	Stainless steel - Class A2-70
Gaskets	NBR
Strainer	Stainless steel - AISI 304

Motor data

Rated voltage	400 V
Frequency	50 Hz
Motor phases	3~
Number of poles	2
Rated power P2	5.50 kW
Incoming power P1	6.32 kW
Rated current	10.8 A
rpm	2866 1/min
Efficiency	87 %
cos φ	0.845
Rated torque	18.3 Nm
Start	Direct starting
Starting current	77.8 A
Degree of protection	IP 68
Insulation class	H
Capacitor	
Starting Capacitor	

Construction features

Cooling system	No cooling jacket
Main cable	4G1,5 + 3x1
Cable length	10 mt
Mechanical seals	2 in silicon carbide (2SiC)
Additional drilling	-
Weight*	60.3 kg
Electrical variant	Thermal protection and leakage sensor

* cable and fixing system excluded

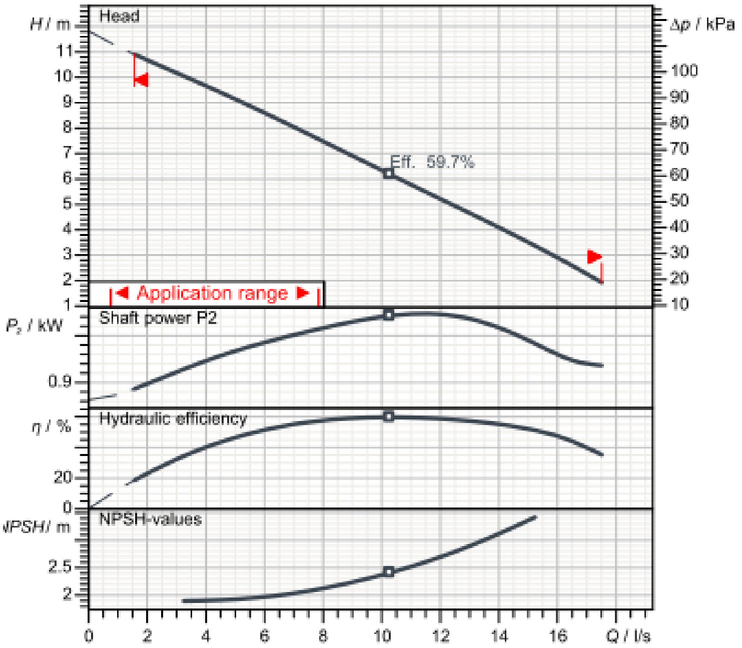
Hydraulic

Free passage	10 mm
Impeller type	High head impeller
Max. hydraulic efficiency	49.9 %
Suction	-
Discharge	DN 50 - G2" EN 1092-2

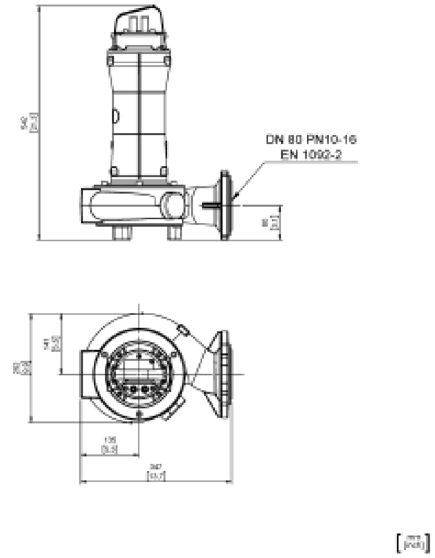
5.4. Pump for water treatment (P05-P06)

Technical specification

3~ 50 Hz



Characteristic curves according to UNI EN ISO 9906:2012
P2<10kW: paragraph 4.4.2
10kW<P2<100kW: Grade 3B
P2>100kW: Grade 2B



Pump

Series	GREY series
Type	DRG 150/2/80 L0AT5
Version	NAE 10 400D NN NN GG
Standard	CE

Operating limits (standard pumps)

Max. ambient temperature	40 °C
Max. density treated liquid	1100 kg/m³
pH treated liquid	6 ÷ 14
Max. start per hour (equally distributed)	30
Wet/dry use	WET
Max. acoustic pressure level	70 dB
Operating mode	S1 - Continuous use

Construction materials

Case	Cast iron EN-GJL 250
Shaft	Stainless steel AISI 431
Hydraulic	Cast iron EN-GJL 250
Impeller	Cast iron EN-GJL 250
Painting/Coating	Bi-epoxy 200 µm sea water
Screws	Stainless steel - Class A2-70
Gaskets	NBR

Motor data

Rated voltage	400 V
Frequency	50 Hz
Motor phases	3~
Number of poles	2
Rated power P2	1.10 kW
Incoming power P1	1.33 kW
Rated current	2.4 A
rpm	2847 1/min
Efficiency	82.7 %
cos φ	0.790
Rated torque	3.7 Nm
Start	Direct starting
Starting current	16.3 A
Degree of protection	IP 68
Insulation class	H
Capacitor	
Starting Capacitor	

Construction features

Cooling system	No cooling jacket
Main cable	4G1
Cable length	10 mt
Mechanical seals	2 in silicon carbide (2SiC)
Additional drilling	-
Weight*	35.5 kg
Electrical variant	No electrical device equipped

* cable and fixing system excluded

Hydraulic

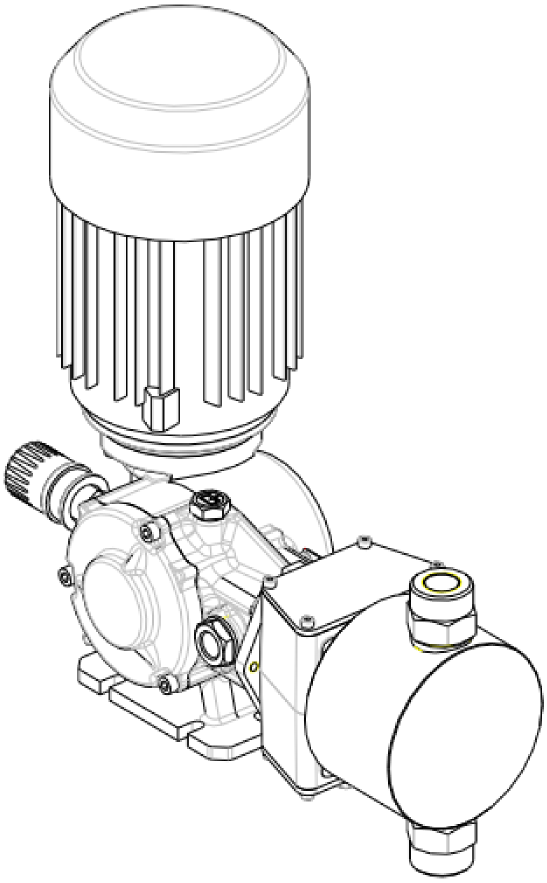
Free passage	35 x 30 mm
Impeller type	Open channel impeller
Max. hydraulic efficiency	59.7 %
Suction	DN 80 UNDRILLED
Discharge	DN 80 EN 1092-2

5.5. Flocculant dosing pump (P09)

DOSING PUMP

SPRING SERIES – PS1 – Plunger piston pump

seko



Technical characteristics

- Flow rates: from 1.5 to 304 l/h
- Max Pressure: up to 20 bar (290 psi)
- Motor:
    - 0.18 kW and 0.25 kW - 3 ph (IP55)
    - 0.25 kW and 0.37 kW - 1 ph (IP55)
- Stroke rate: 58 –116 strokes/minute
- Stroke length: 15 mm
- Piston diameter: from 6 to 64 mm
- Pump head:
    - SS 316 L
    - PVC
- Max. dosing temperature:
    - SS 316 L 90 °C
    - PVC 40 °C
- Ambient dosing temperature:
    - +5 ÷ +45 °C
- Stocking temperature:
    - -10 ÷ +50 °C

Seko plunger piston pump PS1 Series has a wide range product. PS1 Series performances cover a range from 1.5 to 304 l/h with a back pressure up to 20 bar, having several configurations available for the pump head and power, in order to have the characteristics most suitable for processes where required. PS1 pump have a spring return mechanism into an aluminum housing.

Each model has 2 values of stroke rate, which can be set manually or automatically using an actuator which accepts a signal 4÷20 mA. Moreover, they can be supplied with 3 phases or 1 phase electric motor with protection class IP55.

DOSING PUMP

SPRING SERIES – PS1 – Plunger piston pump

seko

PUMP KEY CODE

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8	Field 9	Field 10
P	S1	D	011	C	31	A4	L	0	0

Field 1	model
Field 2	mechanism family
Field 3	stroke length
Field 4	piston diameter
Field 5	stroke rate
Field 6	pump head material
Field 7	electric motor type
Field 8	stroke regulation
Field 9	customization
Field 10	optional

Field 1 **model**

P	***Plunger Piston***

Field 2 **mechanism family**

S1	*Piston*

Field 3 **stroke length**

D	*15 [mm]*

Field 4 **piston diameter**

006	*6 [mm]*
011	*11*
017	*17*
025	*25*
030	*30*
038	*38*
048	*48*
054	*54*
064	*64*

Field 5 **stroke rate**

A	*58 [stroke/1']*
C	*116*

Field 6 **pump head material**

	head	*piston*	*pist. seal*	*valves*	*seat valves*	*O-Ring*	
21	SS316	SS316	FPM	SS316	SS316	FPM	*on Ø 6 - 11*
31	PVC	CERAMIC	FPM	CERAMIC	PTFE	FPM	*on Ø 17 - 25 - 30 - 38*
24	SS316	CERAMIC	EPDM	SS316	SS316	EPDM	*on Ø 6 - 11*
32	PVC	CERAMIC	FPM	SS316	SS316	FPM	*on Ø 17 - 25 - 30 - 38*
34	PVC	CERAMIC	EPDM	CERAMIC	PTFE	EPDM	*on Ø 17 - 25 - 30 - 38*

Field 7 **electric motor type**

A4	*0,18 kW*	(4 poles - 3phases 230-400 Vac 50/60 Hz - size 63-B14)
B4	*0,25 kW*	(4 poles - 3phases 230-400 Vac 50/60 Hz - size 71-B14)
H4	*0,25 kW*	(4 poles - 1phase 230 Vac 50 Hz - size 71-B14)
I4	*0,37 kW*	(4 poles - 1phase 230 Vac 50 Hz - size 71-B14)
AI	*0,18 kW*	(4 poles - 3phases 230-400 Vac 50/60 Hz - size 63-B14 - with INVERTER)
BI	*0,25 kW*	(4 poles - 3phases 230-400 Vac 50/60 Hz - size 71-B14 - with INVERTER)
S0	*WITHOUT motor*	

Field 8 **stroke regulation**

0	*Manual adjustment with knob - STANDARD*
L	*Automatic Linear Actuator AKTUA series*

Field 9 **customization**

0	*Standard*
H	*High Pressure*

Field 10 **optional**

0	*Standard*
2	*(S0 - WHITOUT motor) + adapter kit*

DOSING PUMP

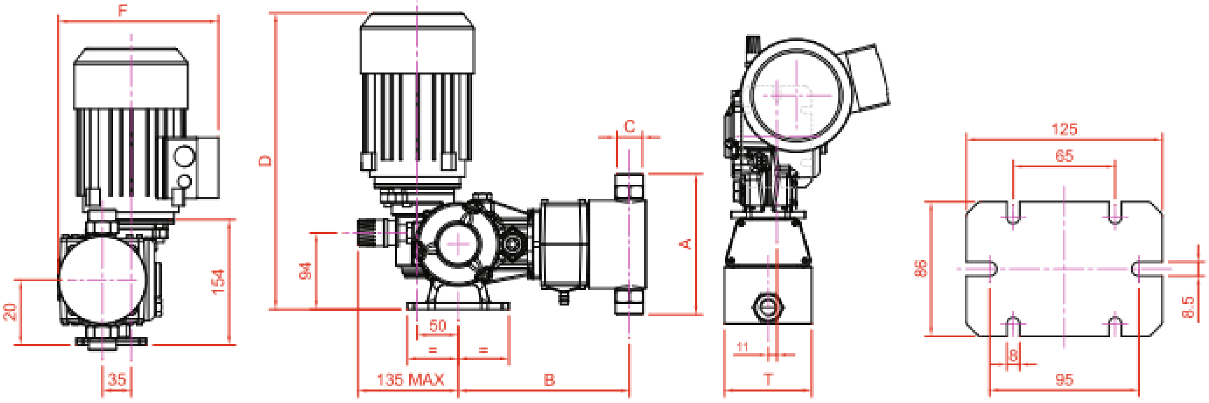
SPRING SERIES – PS1 – Plunger piston pump

HYDRAULIC CHARACTERISTICS

Pump Model	Piston Diameter [mm]	Stroke/min	Flow rate		*Max back pressure*				*Suction/Discharge Connection*		Electric Motor 50/60 Hz 3 phases [kW]
					bar		p.s.i.				
			l/h	gl/h	SS 316	*PVC*	SS 316	*PVC*	SS 316	*PVC*	
PS1D006A	6	58	1,5	0,40	20	10	290	145	1/4" G F	1/4" G F	0,18 (A4)
PS1D006C		116	3	0,79							
PS1D011A	11	58	5	1,32	20	10*	290	145*	1/4" G F	1/4" G F	0,18 (A4)
PS1D011C		116	10	2,64							
PS1D017A	17	58	11	2,90	20	10*	290	145*	3/8" G F	3/8" G F	0,18 (A4)
PS1D017C		116	22	5,81							
PS1D025A	25	58	25	6,60	20	10*	290	145*	3/8" G F	3/8" G F	0,18 (A4)
PS1D025C		116	50	13,21							
PS1D030A	30	58	35	9,25	20	10*	290	145*	3/8" G F	3/8" G F	0,25 (B4)
PS1D030C		116	70	18,49							
PS1D038A	38	58	55	14,53	17	10*	247	145*	3/8" G F	3/8" G F	0,25 (B4)
PS1D038C		116	110	29,06							
PS1D048A	48	58	85	22,45	10	10	145	145	1/2" G F	1/2" G F	0,25 (B4)
PS1D048C		116	170	44,91							
PS1D054A	54	58	110	29,06	8	8	116	116	1/2" G F	1/2" G F	0,25 (B4)
PS1D054C		116	220	58,12							
PS1D064A	64	58	152	40,15	6	4	87	58	3/4" G F	3/4" G F	0,25 (B4)
PS1D064C		116	304	80,31							

***Available with special reinforced pump head for use with pressure up to 20 bar - 9° Field (Optional) in the Key Code identified by "H"**

DIMENSIONS

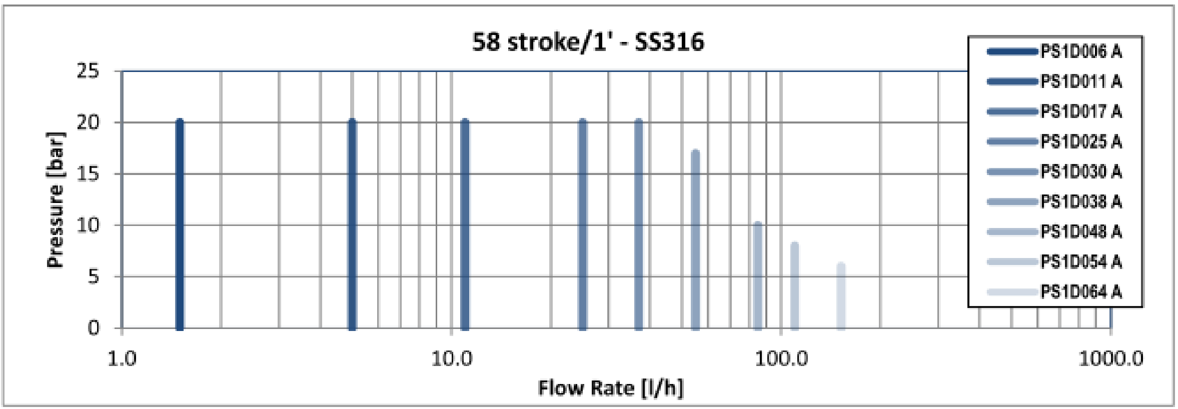


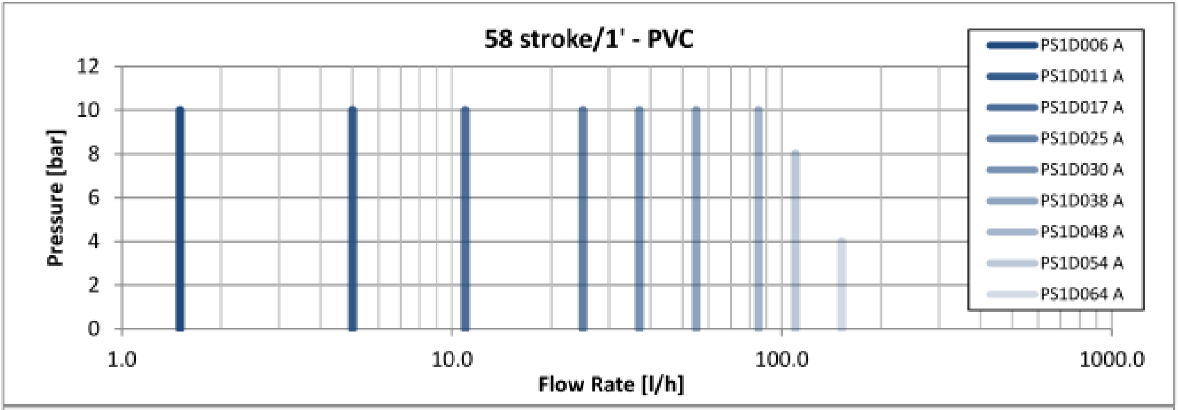
Materiale testata Liquid end material	Diametro pistone Plunger diameter	A[mm]	B[mm]	C (BSP)	T[mm]	Three phase					Single phase				
						Motore 4P Motor 4P [kW]	Gr. motore Motor Size	D[mm]	E[mm]	F[mm]	Motore 4P Motor 4P [kW]	Gr. motore Motor Size	D[mm]	E[mm]	F[mm]
AISI316 (21)	6	161	195	1/4" f	68	0.18	63 B14	333	362	206	0.25	71 B14	371	392	220
	11	161	195	1/4" f	68	0.18	63 B14	333	362	206	0.25	71 B14	371	392	220
	17	121	195	3/8" f	68	0.18	63 B14	333	362	206	0.25	71 B14	371	392	220
	25	121	200	3/8" f	68	0.18	63 B14	333	367	206	0.25	71 B14	371	397	220
	30	122	200	3/8" f	68	0.25	71 B14	371	378	215	0.37	71 B14	371	397	220
	38	164	210	3/8" f	88,5	0.25	71 B14	371	390	215	0.37	71 B14	371	409	220
	48	164	210	1/2" f	88,5	0.25	71 B14	371	390	215	0.37	71 B14	371	409	220
	54	176	210	1/2" f	108	0.25	71 B14	371	392	215	0,37	71 B14	371	411	220
	64	195	215	3/4" f	103	0.25	71 B14	371	401	215	0,37	71 B14	371	420	220
PVC (31)	6	220	195	1/4"f	79	0.18	63 B14	333	368	206	0.25	71 B14	371	398	220
	11	220	195	1/4" f	79	0.18	63 B14	333	368	206	0.25	71 B14	371	398	220
	17	179	195	3/8" f	79	0.18	63 B14	333	368	206	0.25	71 B14	371	398	220
	25	179	200	3/8" f	78	0.18	63 B14	333	377	206	0.25	71 B14	371	407	220
	30	178	200	3/8" f	78	0.25	71 B14	371	388	215	0.37	71 B14	371	407	220
	38	200	210	3/8" f	98	0.25	71 B14	371	402	215	0.37	71 B14	371	421	220
	48	244	210	1/2" f	108	0.25	71 B14	371	403	215	0.37	71 B14	371	422	220
	54	253	210	1/2" f	118	0.25	71 B14	371	403	220	0,37	71 B14	371	422	225
	64	273	215	3/4" f	120	0.25	71 B14	371	413	220	0.37	71 B14	371	432	225

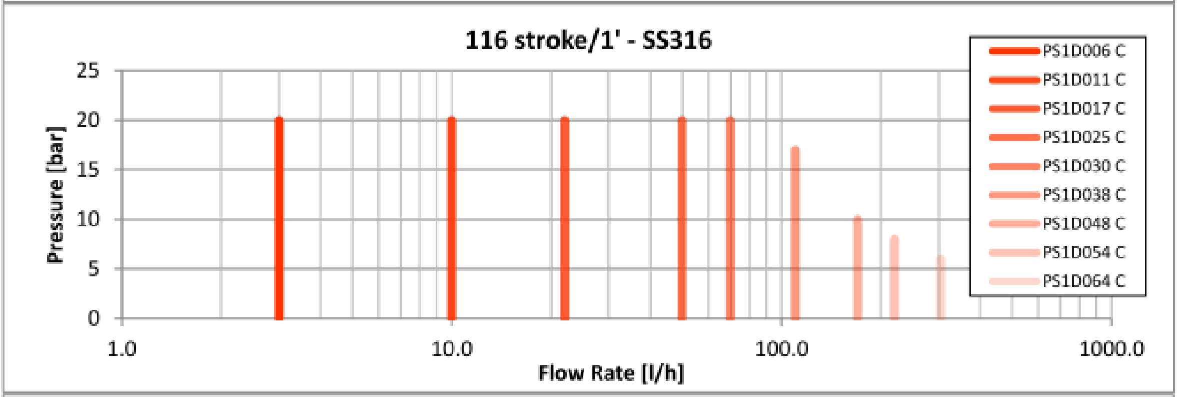
DOSING PUMP

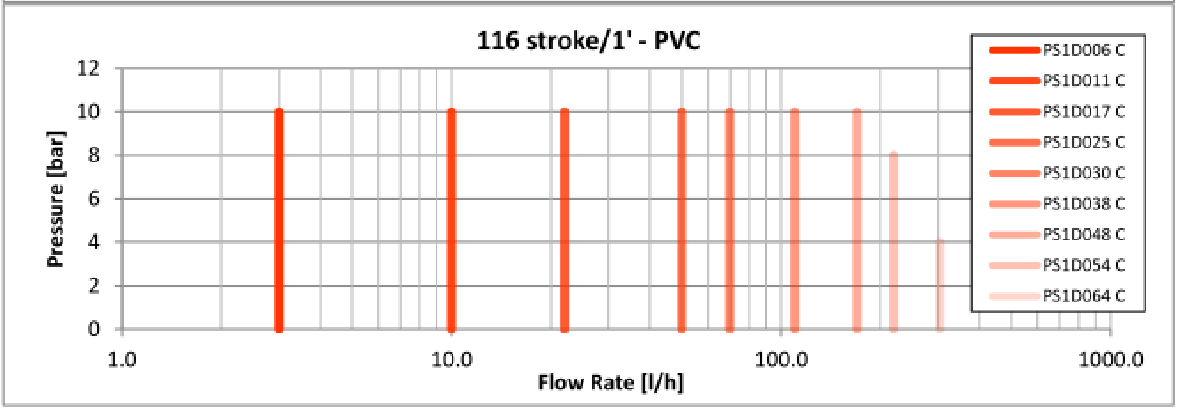
SPRING SERIES – PS1 – Plunger piston pump

seko







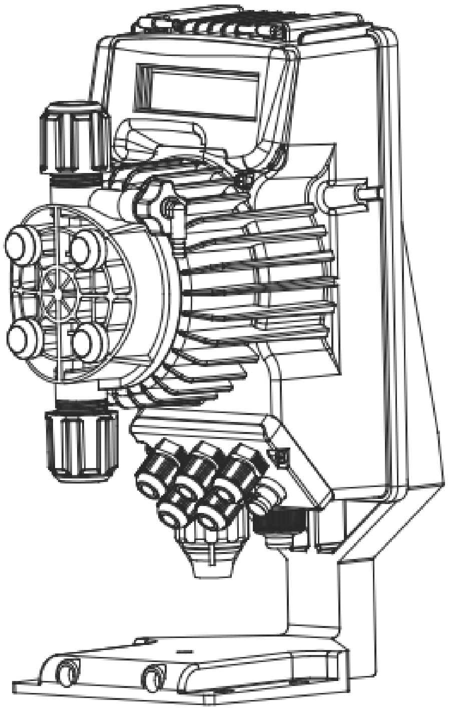


5.6. Coagulant and neutralizing dosing pump (P010-P11)

DOSING PUMP

TEKNA TPG SERIES – Solenoid Dosing Pump

seko



TECHNICAL CHARACTERISTICS

- Flow rates: from 0.4 to 110 l/h
- Max back pressure: up to 20 bar
- Power supply:
    - 100÷240V 50/60 Hz
- Stroke rate: from 120 to 300 strokes/minute
- Pump head:
    - PVDF
- Diaphragm: PTFE
- External Enclosure: PP reinforced with fiber glass protection degree IP65
- Manually priming valve
- Installation kit: Included

Seko Tekna TPG Series is the digital interface version of APG model:

- constant flow rate manually adjustable
- proportional flow rate according to an external analogic (4-20 mA) or digital signal (water meter, 1:n or n:1)
- Timer function
- ppm proportional dosing
- Statistics
- Password
- Input On-Off (remote control)

Also with this pump, with only 5 sizes, is possible to cover a wide range of performances, having a flow rate range from 0.4 to 110 l/h and a back pressure from 0.1 to 20 bar. The power supply is 100÷240 Vac – 50/60 Hz, therefore the same pump can operate with different supply voltage. The standard pump head is in PVDF, therefore high chemical compatibility with several liquids end but is available in PVC as well, on request. Also Tekna TPG Series is equipped with a manually priming pump for the start up.

The pump is furnished with a complete standard installation kit, which includes: PVDF foot filter and injection valve, PVC suction tube, PE delivery tube. Moreover is available an installation kit in PVDF-T, on request.

DOSING PUMP

TEKNA TPG SERIES – Solenoid Dosing Pump

seko

PUMP KEY CODE

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7
TPG	500	N	H	H	0	000

Field 1	model
Field 2	hydraulics
Field 3	power supply
Field 4	liquid end
Field 5	installation kit
Field 6	seals
Field 7	customization

Field 1 model

Digital
TPG

Field 2 hydraulics

	bar	l/h	stroke/1'	ml/stroke	tubing Ø	consumption
500	20	0,4	120	0,06	in - 4/6 out - 4/7	-
	16	0,8		0,11		
	10	1,2		0,17		
	6	1,5		0,21		
600	20	2,5	120	0,35	in - 4/6 out - 4/7	20
	18	3		0,42		
	14	4,2		0,58		
	8	7		0,97		
603	12	4	160	0,42	in - 4/6 out - 4/6	22
	10	5		0,52		
	8	6		0,63		
	2	8		0,83		
800	16	7	300	0,39	in - 4/6 out - 4/6	36
	10	10		0,56		
	5	15		0,83		
	1	18		1,00		
803	5	20	300	1,11	in - 8/12 out - 8/12	-
	4	32		1,78		
	2	62		3,44		
	0	110		6,11		

Field 3 power supply

N	100÷240 Vac

Field 4 liquid end

	Body	Connections	Balls	Diaphragm
H	PVDF	PVDF	Ceramic	PTFE
A	PVDF	PVDF	Ceramic	PTFE
I	AISI316L		AISI316L	PTFE

A *Pump head with automatic degassing valve. Only for 603 and 800 series*

Field 5 installation kit

H	PVDF
P	PVDF-T

Field 6 seals

0	FPM
1	EPDM
2	Elastomer Free

Field 7 customization

000	standard

DOSING PUMP

TEKNA TPG SERIES – Solenoid Dosing Pump

seko

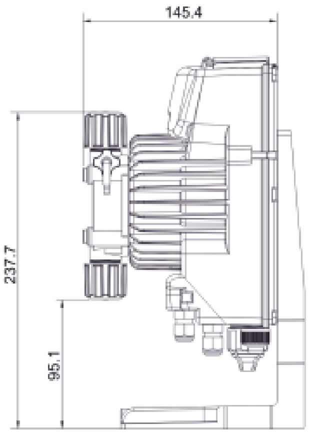
HYDRAULIC CHARACTERISTICS

Pump model	Pressure [bar]	Flow Rate [l/h]	Frequency max [stroke/min]	*Stroke capacity [cc/stroke]*	*Connection [mm]*		Power supply	Consumption [W]	
					Suction	Discharge		Min	Max
TPG500N	20 16 10 6	0,4 0,8 1,2 1,5	120	0,06 0,11 0,17 0,21	*4/6*	*4/7*	100÷240 Vac	-	-
TPG600N	20 18 14 8	2,5 3,0 4,2 7,0	120	0,35 0,42 0,58 0,97	4/6	4/7	100÷240 Vac	14,0	20,0
TPG603N	12 10 8 2	4,0 5,0 6,0 8,0	160	0,42 0,52 0,63 0,83	4/6	4/6	100÷240 Vac	15,0	22,0
TPG800N	16 10 5 1	7,0 10,0 15,0 18,0	300	0,39 0,56 0,83 1,00	4/6	4/6	100÷240 Vac	22,0	36,0
TPG803N	5 4 2 0	20,0 32,0 62,0 110,0	300	1,11 1,78 3,44 6,11	8/12	8/12	100÷240 Vac	-	-

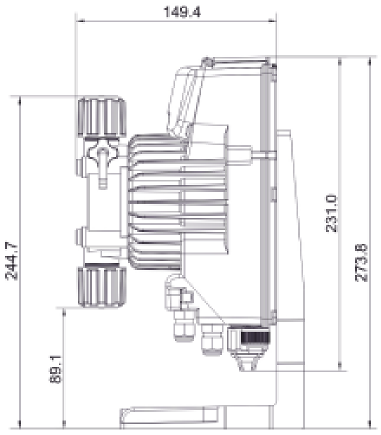
The Pressure Data in the table refer to the measured parameters on the plant, including the use of SEKO STANDARD injection fitting.

***Minimum consumption at 0 bar of back pressure (Patented)**

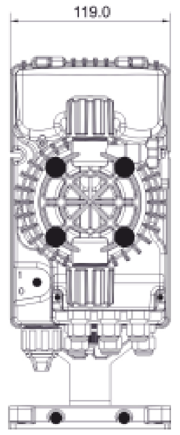
DIMENSIONS



500 – 600 – 603 – 800



803



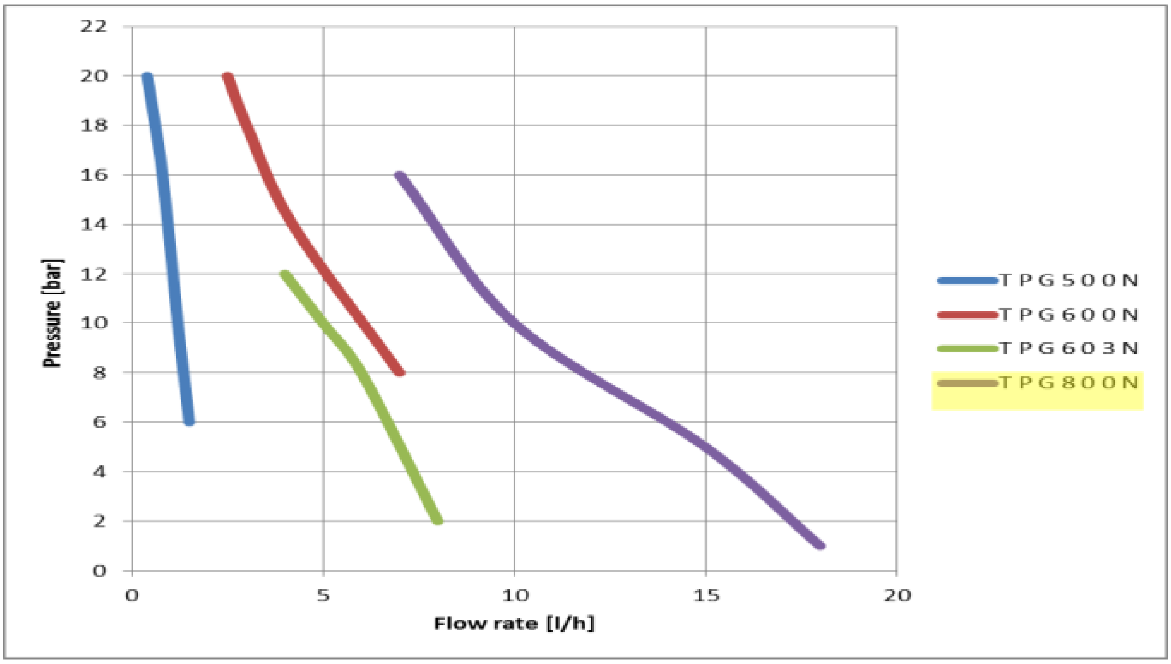
500 – 600 – 603 – 800 – 803

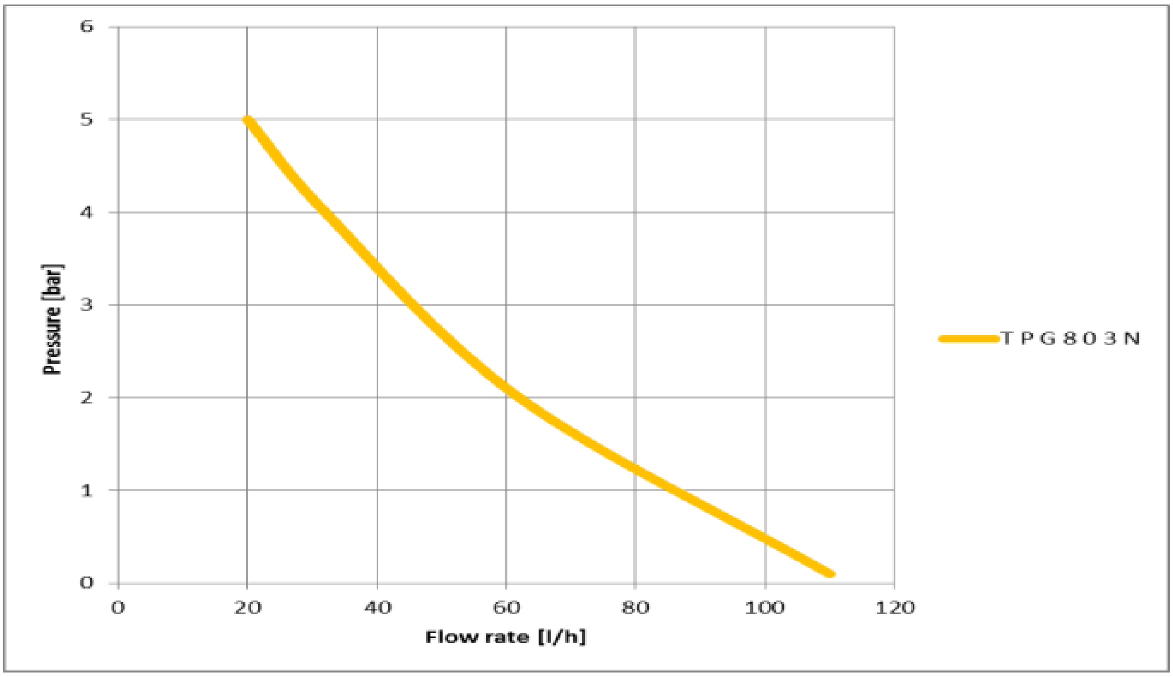
DOSING PUMP

TEKNA TPG SERIES – Solenoid Dosing Pump

seko

INSTALLATION KIT	PVDF	PVDF-T
PVDF foot filter	●	
PVDF injection valve	●	
PVDF-T foot filter		●
PVDF-T Injection valve		●
PVC suction tube (4 m)	●	
PE delivery tube (2 m)	●	
Wall and base fixing bracket	●	





5.7. PH controller SPR40 + PH probes

Controller Instrument
Kontrol 40 SERIES

seko

KONTROL 40

The Kontrol 40 series are single parameter controllers. These very user-friendly systems combine advanced performance and simple design. Single-parameter units are available in four different casings, ensuring perfect fit at the right price.

TECHNICAL CHARACTERISTICS

Graphic display and Keypad
Simultaneous value of the measure, Temperature and Relay status. 2-line, 16 character Alphanumeric Display. Four control keys for instrument calibration and configuration.

Enclosure Box and Power Supply
Four (4) mechanical box:
Wall mounting PP (IP65)
Panel mouting: 96x96 IP65 Front panel; 48x96 IP40; Din-Rail (6 modul) IP40
Universal Power Supply 100÷240 Vac 50/60 Hz and 24Vac/dc

Measure Input
High measuring resolution with probe quality control. A modular measuring system Chlorine measure in sea water application.

Current outputs 4÷20mA Galvanic isolation
One independent programmable Output Measures
Relay Outputs
Two (2) independent function, two Set point Measure, dry contact. Software-set alarm functions.
Routine function settings : ON/OFF, Timed or proportional

Digital Input
Dedicated and level input to disable all controller output functions.

.APPLICATIONS

- Waste water
- Legionella disinfection
- Sea water
- Crate wash

Controller Instrument

Kontrol 40 SERIES

- CIP
- Dioxide station
- Drinking water
- Cooling towers
- Swimming pool
- Boilers
- Reverse osmosis
- Galvanic process
- Irrigation

PRODUCTS KEY

S	**Instrument**

CD	**Conductivity**
FX	Flow rate
CL	Potentiostatic Chlorine
PR	pH/Orp and pH/Orp

040	Kontrol 40

D	**Box type DIN**
Q	box type 48x96
P	box type 96X96
L	box type 144X144
W	box type 144X144 (IP65)

A	**230 Vac**
B	24 Vac
C	115 Vac
M	Switching 80÷265 Vac

0	**FREE/CUSTOM**

0	**FREE/CUSTOM**

0	**FREE/CUSTOM**

0	**FREE/CUSTOM**

S	**CD**	**040**	**W**	**A**	**0**	**0**	**0**	**0**

Controller Instrument
Kontrol 40 SERIES

seko

PRODUCT LINE

	Ph/ORP	conductivity	Chlorine amperometric cell	Chlorine potentiostatic cell	Flow rate
SPR040	●				
SCD040		●			
SCL040				●	
SFX040					●

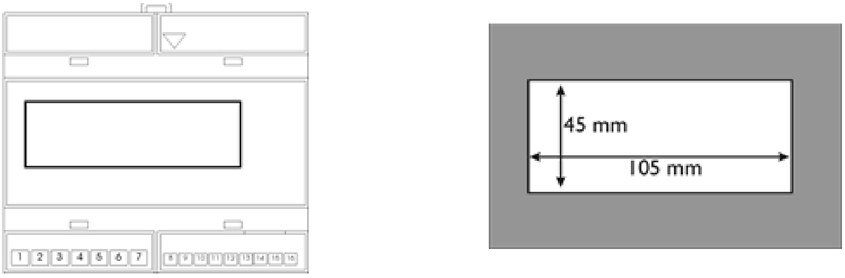
MEASURE RANGE

Measure	Description	Accuracy
pH	0 ÷ 14,00 pH	±0,1pH
ORP	±1500 mV	±5 mV
Conductivity	1÷50.000 µS	±5%
Flow Rate	0,00÷99.999 Liters/Sec.	±0,5Hz
Chlorine	0,00÷200.00 ppm	±0,01ppm
Temperature	0÷100°C (-32÷212 °F ±1,8°F)	±1,0°C

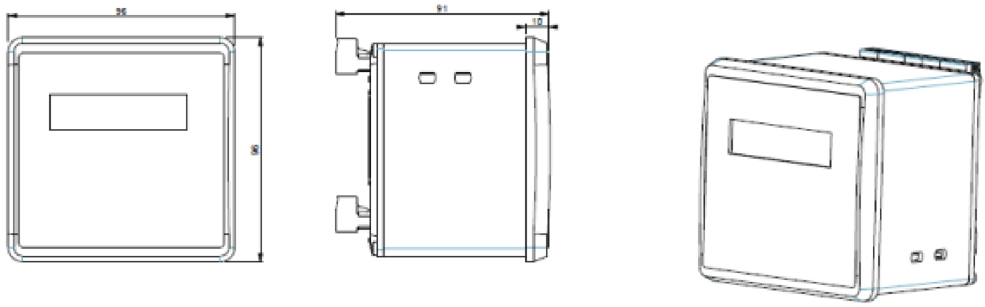
Controller Instrument
Kontrol 40 SERIES

DIMENSIONS

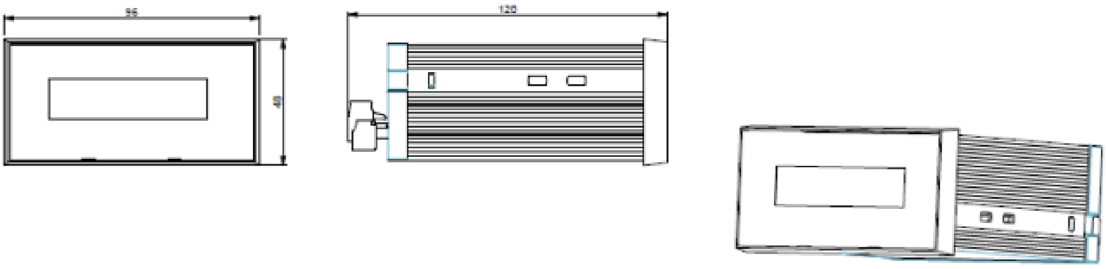
Din rail IP40


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
45 mm
105 mm

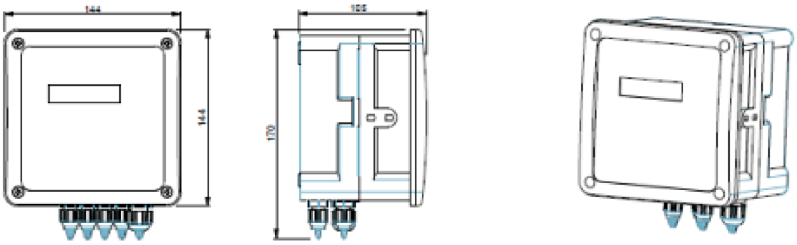
96x96 IP65Panel



48x96 Panel version



Wall mounting IP65


144
144
105
170

PH PROBES

PH PROBES_ SPH3_WW

Features:

- Low maintenance sealed unit
- Gel filled reference cell
- S8 connection with PG 13,5 mm
- Glass Body
- Diaphragm open hole

Field Application:

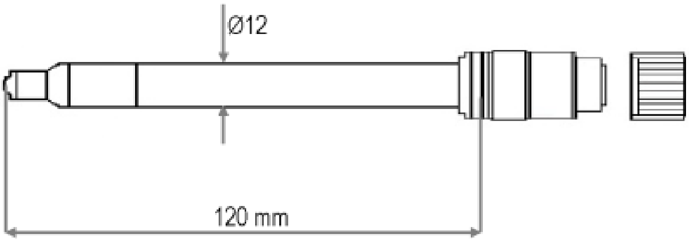
- Wast water
- Drinking Water
- Cooling Towers
- Fish farming
- Galvanic Process

- Features:
  - Range: pH 2÷12
  - Temperature: 0÷80 °C
  - Pressure: 6 Bar
  - Trasparten glass Body
  - **Double junction** with KCL Gel and **one open hole**.
  - S8 connector: PG13,5 mm mechanical connection and S7 electrical connection.
  - Batch production number.
  - Single Package with neutral carton box.
  - Neutral Label.

TECHNICAL CHARACTERISTICS

pH Range:	2 ÷ 12
Min. Conductivity:	5 µS/cm
Temp. Range:	80° C
Pressure Range:	up to 6 bar
Body material:	Glass
Diaphragm material:	Glass
Diaphragm type:	1 open hole
Mechanical Mounting:	PG 13.5 mm
Electrical Connection:	S7 electrical connection
Reference:	GEL
Storage temperature	+2 ÷ 50 °C (**do not freeze**)

DIMENSIONS



5.8. Container's cooling system

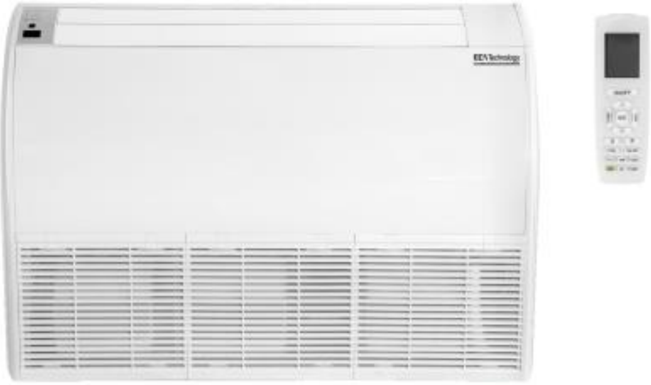
ECA Technology
ENERGY AND AIR-CONDITIONING SOLUTIONS

COMMERCIAL SOLUTIONS

FSV - Floor - Ceiling Air Conditioner

The **floor-ceiling units** are ideal for applications in the small commercial/ tertiary sectors such as shops, offices, meeting rooms, hotels, restaurants, clubs, gyms and open space areas.

The compact design (only 235 mm deep) allows **versatile installation**.
The wide swing angle of the louvres also allows horizontal air flow for ceiling applications – this prevents direct air flows onto persons in the room.
When the unit is switched off, the air delivery louvres can be completely closed to prevent dust from entering the unit and keep the air conditioner clean.



FSV Floor-Ceiling

TECHNICAL DATA

FSV - **Floor - Ceiling** Air Conditioner

Heating and Cooling
Automatic operation
Dry Mode
Different ventilation speeds
Turbo
I Feel
Sleep
Wi-Fi Optional
Room temperature control
Quiet
Timer
Light
Self-Cleaning
Intelligent defrosting
Anti Cold air at heat. start-up
Auto Restart
Self-Diagnostics

MODEL		**I.U.**	**FSV1818HE32**	**FSV2418HE32**	**FSV3618HE32**
		O.U.	**MSV1818HE32**	**MSV2418HE32**	**MSV3618HE32**
Power supply		V/Ph/Hz	230/1/50		
Seasonal efficiency in Cooling mode	Pdesign	kW	5.0	7.0	10.0
	SEER		6.1	6.8	6.1
	Annual energy consump.	kWh/a	284	359	561
	Energy Label		A++	A++	A++
Seasonal efficiency in Heating mode - average/warmer climate	Pdesign	kW	4.0	6.4	9.0
	SCOP		4.0	3.9	4.0
	Annual energy consump.	kWh/a	1394	2295	3146
	Energy Label		A+	A	A+
Nominal cooling capacity (min-max)		kW	5.00 (1.60-5.50)	7.00 (2.40-8.00)	10.00 (3.20-11.00)
		BTU/h	17000 (5459-18766)	23800 (8189-27296)	34100 (10918-37532)
Nominal cooling electric power (min-max)		kW	1.55 (0.30-1.75)	1.90 (0.40-3.50)	3.30 (0.60-4.65)
Nominal heating capacity (min-max)		kW	5.50 (1.50-6.00)	8.00 (2.20-9.00)	12.00 (2.90-14.50)
		BTU/h	18700 (5118-20472)	27200 (7506-30708)	40900 (10236-46062)
Nominal heating electric power (min-max)		kW	1.60 (0.30-1.75)	2.45 (0.45-3.50)	3.50 (0.60-4.65)
EER / COP			3.23/3.44	3.68/3.27	3.03/3.43
Indoor unit air flow volume (SH/H/M/L)		m³/h	850/800/700/600	1300/1220/1090/940	1600/1500/1350/1260
Outdoor unit air flow volume		m³/h	3000	3600	5900
Indoor unit sound pressure (SH/H/M/L)		dB(A)	44/42/39/36	45/44/41/38	49/47/45/43
Indoor unit sound power (SH/H/M/L)		dB(A)	57	57	61
Outdoor unit sound pressure (H)		dB(A)	53	52	55
Outdoor unit sound power (H)		dB(A)	65	67	70
Indoor unit dimensions (HxWxD)		mm	665x870x235	665x1200x235	665x1200x235
Indoor unit weight		kg	26	31	32
Outdoor unit dimensions (HxWxD)		mm	596x818x302	698x892x340	820x940x460
Outdoor unit weight		kg	39	53	89
Pipe length: min-max with standard charge / with additional charge		m	7 / 35	7 / 50	7 / 65
Max height difference		m	20	25	30
Liquid/gas pipe diameter		mm (inch")	6.35 (1/4") / 12.7 (1/2")	9.52 (3/8") / 15.8 (5/8")	9.52 (3/8") / 15.8 (5/8")
Refrigerant type/standard charge		type/kg	R32 / 1.00	R32 / 1.60	R32 / 2.50
Global warming potential / CO2 equiv.tons		GWP/tons	675 / 0.675	675 / 1.080	675 / 1.688
Refrigerant addition beyond max length with standard charge		g/m	16	25	35
Heating/cooling ambient operating temp. range		°C	-20 to 24 / -20 to 48	-20 to 24 / -20 to 48	-20 to 24 / -20 to 48
CODE		**I.U.**	**2701133**	**2701134**	**2701135**
		O.U.	**2701533**	**2701534**	**2701535**

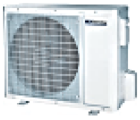
OPTIONAL ACCESSORIES	**CODE**
Wired controller with weekly timer	**2701451**
Wired controller for control of up to 36 indoor units*	**2701456**
Modbus Gateway	**2701454**
Wi-Fi Module	**2701455**
ON - OFF remote control kit (to be combined with wired controller)	**2701450**

* Each indoor unit must be equipped with a Modbus Gateway cod. 2701454 to enable communication with the central wired controller.

MSV - Outdoor unit

An efficient air conditioning system must include the power and design of its outdoor units.
The use of high quality components, special focus on insulation and the robustness of the metal structure guarantee long life and resilience, even in the most troublesome climatic conditions.
The high drainage capacity of the outdoor unit's chassis prevents ice formation in the harshest climates and ensures optimum reliability and performance.

ECA Technology's range of commercial air conditioners meets the needs of the most varied installation requirements, adapting to industrial production areas, shops, supermarkets, offices, healthcare facilities, hotels, restaurants, bars and accommodation, public places and outdoor areas.

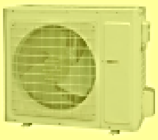


MSV1218

COMMERCIAL LINE OUTDOOR UNIT

MSV1818

COMMERCIAL LINE OUTDOOR UNIT



MSV2418

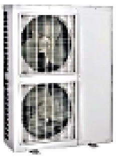
COMMERCIAL LINE OUTDOOR UNIT

MSV3618 / MSV4818

COMMERCIAL LINE OUTDOOR UNIT

MSV6018

COMMERCIAL LINE OUTDOOR UNIT



HMSV 2519 / 3019

COMMERCIAL LINE OUTDOOR UNIT

5.9. “Y” filter on pressure pipe of washing pumps

FILTRO A RETE

MESH FILTERS | FILTRE A TAMIS

Il filtro a rete è il più diffuso negli impianti di filtrazione per **irrigazione a goccia** e **microaspersione**. E' un filtro a funzionamento interno-esterno, costruito interamente in acciaio zincato a caldo o verniciato. La rete filtrante è in poliestere e la cartuccia di sostegno in acciaio inox AISI 304.
L'elemento filtrante è facilmente estraibile dal corpo in modo da permettere un'accurata pulizia.
Questi filtri sono destinati ad acqua relativamente pulita e difatti vengono utilizzati come filtri secondari nelle acque di superficie o come filtri primari con sorgenti o acquedotti.

The mesh filter is the most common in filtration systems for **drip irrigation** and **micro-sprinkling**. It is an internal-external filter, built entirely of hot-dip galvanized steel or painted. The filtering net is in polyester and the support cartridge in AISI 304 stainless steel.
The filter element is easily removable from the body in order to allow thorough cleaning. This filter is suitable for relatively clean water and is used as secondary filters in surface waters or as primary filters with springs or aqueducts.

Le filtre à mailles est le plus courant dans les systèmes **d’irrigation goutte à goutte** et **de micro-irrigation**. Il s’agit d’un filtre interne-externe, entièrement construit en acier galvanisé à chaud oupeinture. Le filet filtrant est en polyester et la cartouche de support en acier inoxydable AISI 304.
L'élément filtrant est facilement amovible du corps pour permettre un nettoyage en profondeur. Ce filtre est destiné à une eau relativement propre et est en fait utilisé comme filtressecondaires dans les eaux de surface ou comme filtres primaires avec des sources ou des aqueducs.

MATERIALI

MATERIALS | MATÉRIAUX

- Cartuccia in acciao inox
- Stainless steel cartridge
- Cartouche en acier inoxydable

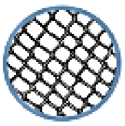
- Corpo in acciaio zincato a caldo
- Body in hot galvanized steel
- Corps en acier galvanisé à chaud

- Calza in poliestere
- Polyester sock
- Chaussette en polyester

CARATTERISTICHE

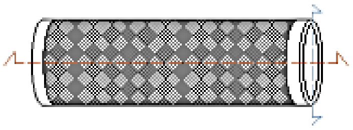
FEATURES | CARACTERISTIQUES

- Grado di filtrazione massima: 120 mesh
- Maximum filtration degree
- Degré de filtration maximale



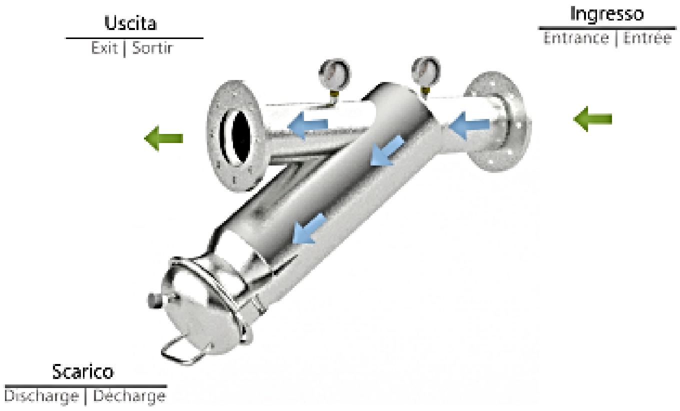
- Il filtro è fornito con valvola di spurgo e manometri
- The filter is supplied with a purge valve and pressure gauges
- Le filtre est fourni avec une vanne de purge et des manomètres

- Tipologie di attacchi disponibili: sferico,filettato e flangiato
- Types of connections available: spherical, threaded and flanged
- Types de connexions disponibles: sphériques, filetées et à brides



CARTUCCIA FILTRO
FILTER CARTRIDGE | CARTOUCHE DE FILTRE

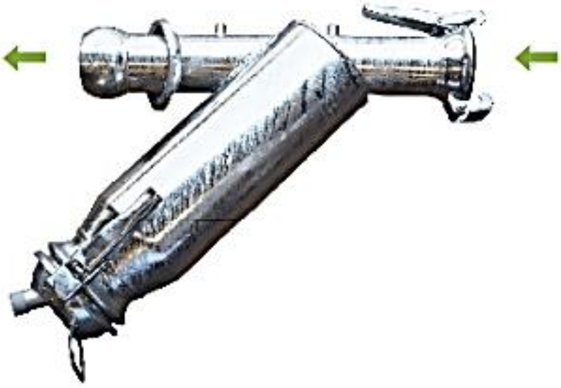
DIAMETRO	D	H
60	91 mm	360
80	113 mm	410
100	113 mm	500

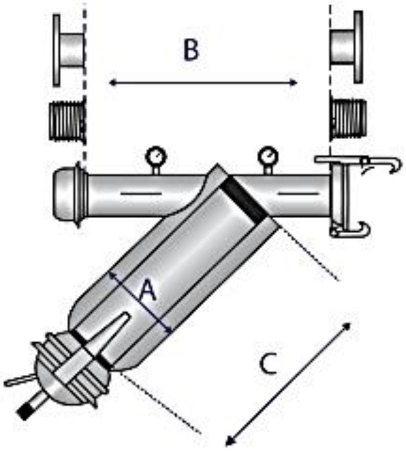


ART. 050-051-02

FILTRI A RETE - TIPO "A" CARATTERISTICHE TECNICHE

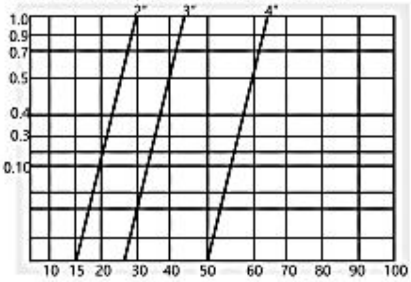
Mesh filters - type "a" technical features | Filtre a tamis - caractéristiques techniques de type «a»

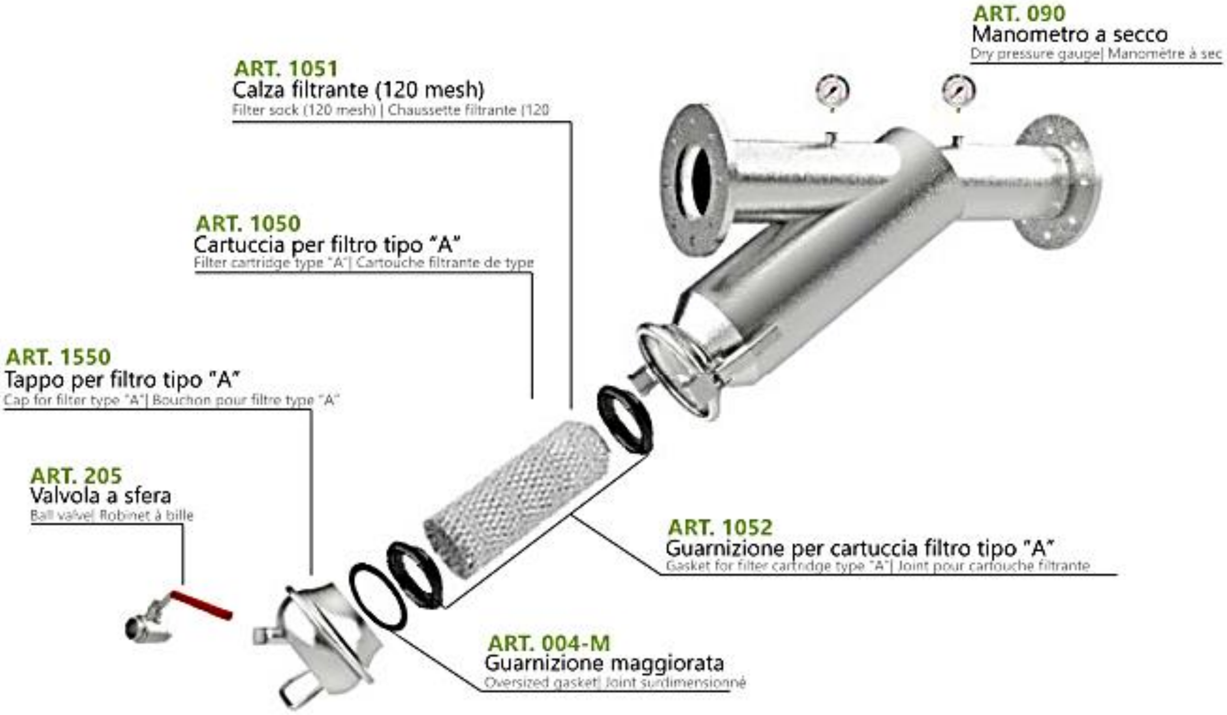




DIAMETRO	PORTATA MASSIMA		PRESSIONE MASSIMA	DIMENSIONI			PESO
	Lit/s	Mc/h		A	B	C	
60-2"	5	18	6	159	390	365	10 Kg
80-3"	10	36	6	193	450	415	16 Kg
100-4"	20	72	6	193	550	520	18 Kg

TABELLA PERDITA DI CARICO
LOAD LOSS TABLE| TABLEAU DE PERTE DE CHARGE




ART. 090
Manometro a secco
Dry pressure gauge| Manomètre à sec
ART. 1051
Calza filtrante (120 mesh)
Filter sock (120 mesh) | Chaussette filtrante (120
ART. 1050
Cartuccia per filtro tipo "A"
Filter cartridge type "A"| Cartouche filtrante de type
ART. 1550
Tappo per filtro tipo "A"
Cap for filter type "A"| Bouchon pour filtre type "A"
ART. 205
Valvola a sfera
Ball valve| Robinet à bille
ART. 1052
Guarnizione per cartuccia filtro tipo "A"
Gasket for filter cartridge type "A"| Joint pour cartouche filtrante
ART. 004-M
Guarnizione maggiorata
Oversized gasket| Joint surdimensionné

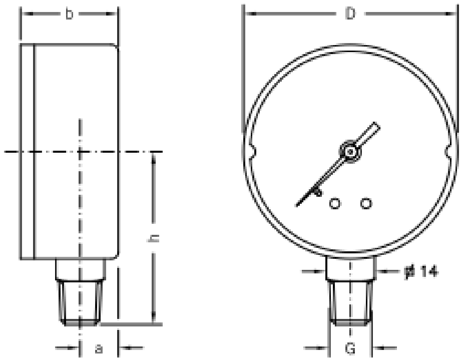
FILTRO A RETE TIPO "A"

5.10. Pressure gauge installed on "Y" filter

MANOMETRI A MOLLA BOURDON, ATTACCO RADIALE
versione standard DN 40–50–63

BOURDON SPRING PRESSURE GAUGES, BOTTOM CONNECTION
standard version DN 40–50–63

M 40 RP
M 50 RP
M 63 RP



> DIMENSIONI E PESI / SIZES AND WEIGHTS

MOD.	D	G	a	b	h	PESO/WEIGHT
M 40 RP	41 mm	R1/8"	10 mm	26 mm	36 mm	**55 gr**
M 50 RP	52 mm	R1/4"	11 mm	28 mm	45 mm	**72 gr**
M 63 RP	62 mm	R1/4"	11 mm	28 mm	50 mm	**88 gr**

> APPLICAZIONI

Manometri standard di uso generale per la misura della pressione di fluidi liquidi o gassosi purchè non altamente viscosi, cristallizzanti o corrosivi per leghe di rame e di stagno.

> PRINCIPALI SETTORI DI IMPIEGO

- impianti e apparecchiature per idrotermosanitaria
- impianti di riscaldamento
- pneumatica e idraulica
- automazione industriale
- apparecchiature tecnico industriali

> APPLICATIONS

They are suitable for measuring the pressure of liquid or gaseous fluids, provided the latter are not highly viscous, crystallising or corrosive to copper and tin alloys.

> MAIN FIELDS OF APPLICATION

- plumbing equipment and systems
- heating systems
- pneumatics and hydraulics
- industrial automation
- industrial items and technical equipment

> RIFERIMENTI NORMATIVI

- EN 837-1
  classe di precisione 2,5
- direttiva CE 2014-68 PED
- grado di protezione IP31 secondo EN 60529

> LIMITI DI IMPIEGO

Temperature
Sul corpo del manometro -40 ÷ +70 °C
Del fluido in pressione max 90 °C
Pressioni
Fino a 3/4 del valore di fondo scala per pressioni statiche
Fino a 2/3 del valore di fondo scala per pressioni fluttuanti
Fino al valore di fondo scala per brevi periodi
Fluidi
Liquidi o gassosi non corrosivi per leghe di rame, non cristallizzanti, non altamente viscosi
Non adatti per ossigeno

> NORMATIVE REFERENCES

- EN 837-1
  2.5 precision class
- directive CE 2014-68 PED
- degree of protection IP31 according to EN 60529

> OPERATING LIMITS

Temperatures
On the body of the pressure gauge -40 ÷ +70 °C
Of pressurized fluid max 90 °C
Pressure
Up to 3/4 of the full scale value for static pressures
Up to 2/3 of the full scale value for fluctuating pressure
Up to the full scale value for short periods
Fluids
Liquid or gaseous non-corrosive to copper alloys, not highly viscous, not crystallising
Gauges not suitable for oxygen

5.11. Floating sensor for coagulant and neutralizing products (LC06-LC07)

PVDF level probe

Data Sheet

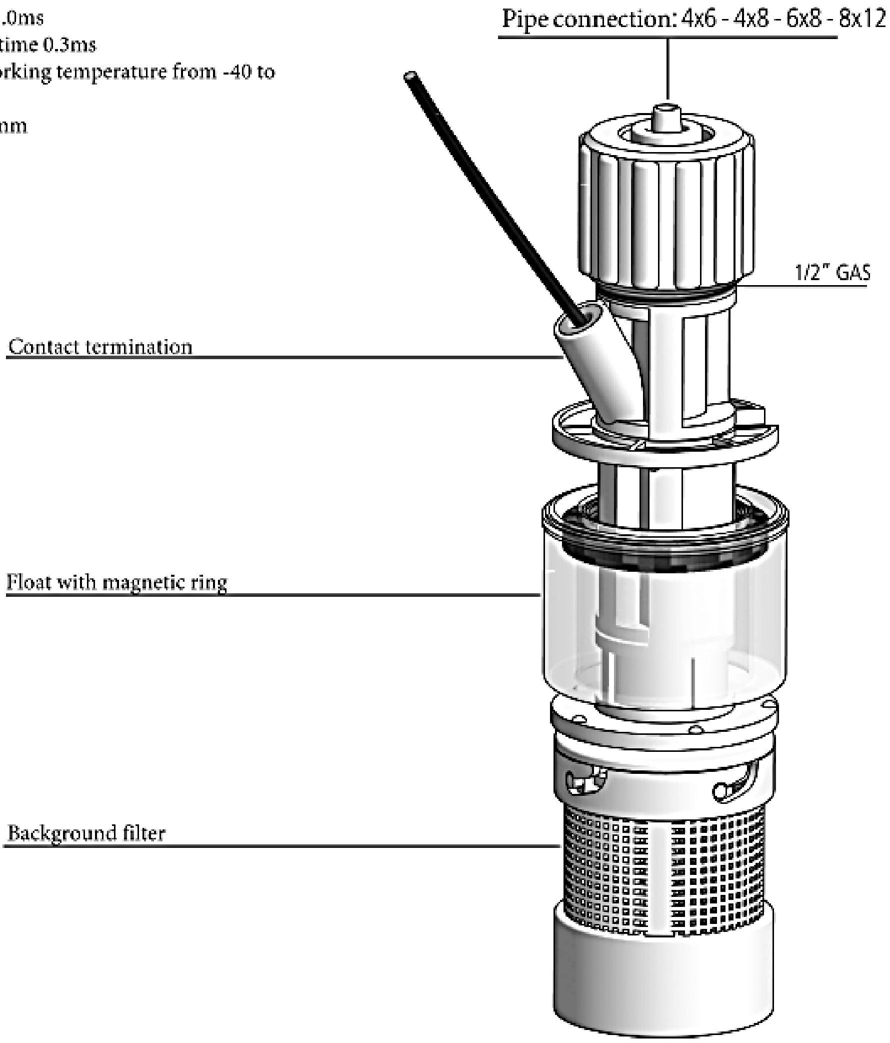
Compact level sensor with "reed" type magnetic contact.
Resistant to high temperatures, independent of the density, opacity, conductivity or dielectric constant of the liquid.
Operation between 0 and 60°C.
Available in the version with "BNC" terminal connector or with wire termination for terminal block.

CONSTRUCTION MATERIALS

- Body completely in PVDF
- Sealing with epoxy resin
- Contact wire sheath in PE

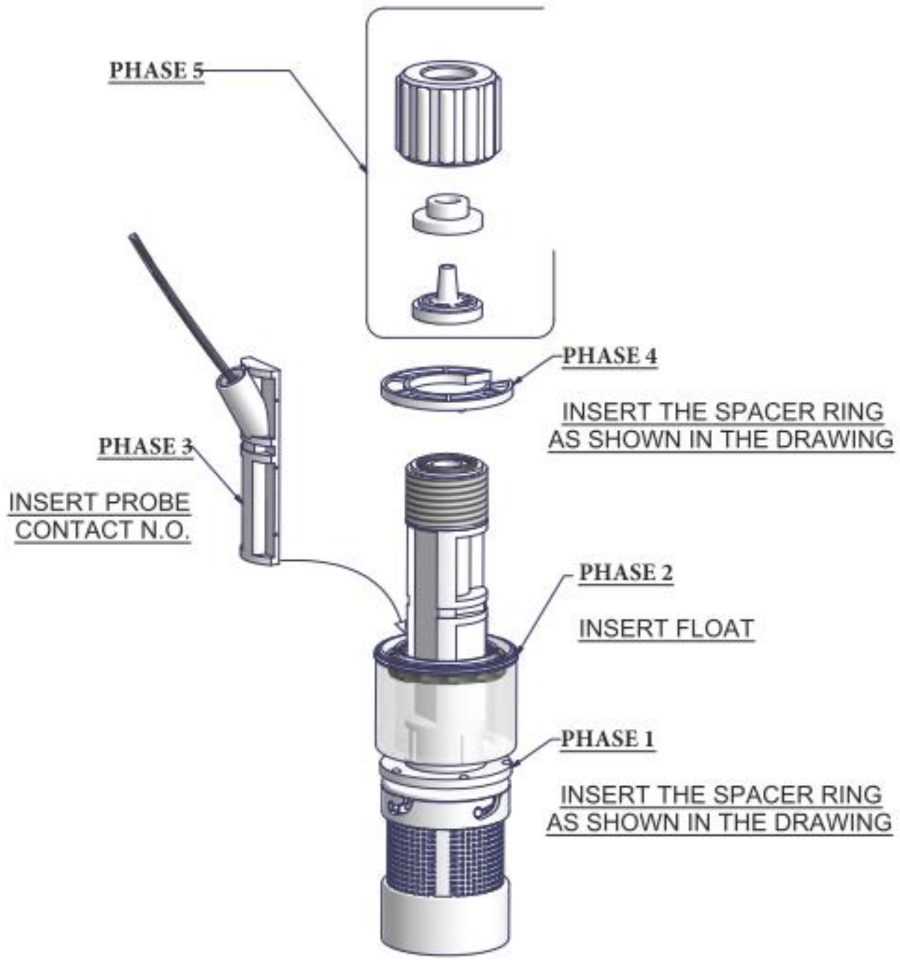
REED CONTACT TECHNICAL DATA

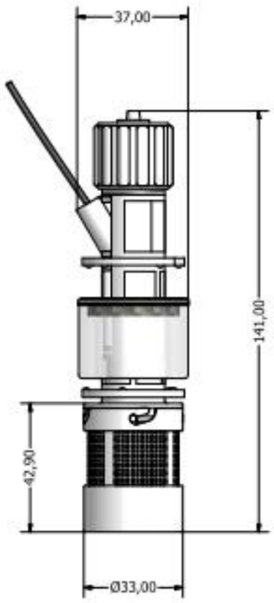
- Maximum power 10W
- Material Contact Ru
- Response time 1.0ms
- Contact release time 0.3ms
- Reed contact working temperature from -40 to +125°C
- Total length 20mm

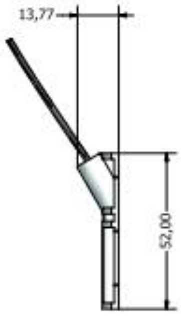

Pipe connection: 4x6 - 4x8 - 6x8 - 8x12
1/2" GAS
Contact termination
Float with magnetic ring
Background filter

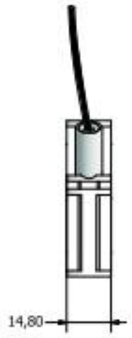
PVDF level probe

Data Sheet


PHASE 5
PHASE 4
INSERT THE SPACER RING
AS SHOWN IN THE DRAWING
PHASE 3
INSERT PROBE
CONTACT N.O.
PHASE 2
INSERT FLOAT
PHASE 1
INSERT THE SPACER RING
AS SHOWN IN THE DRAWING


37,00
141,00
42,90
Ø33,00

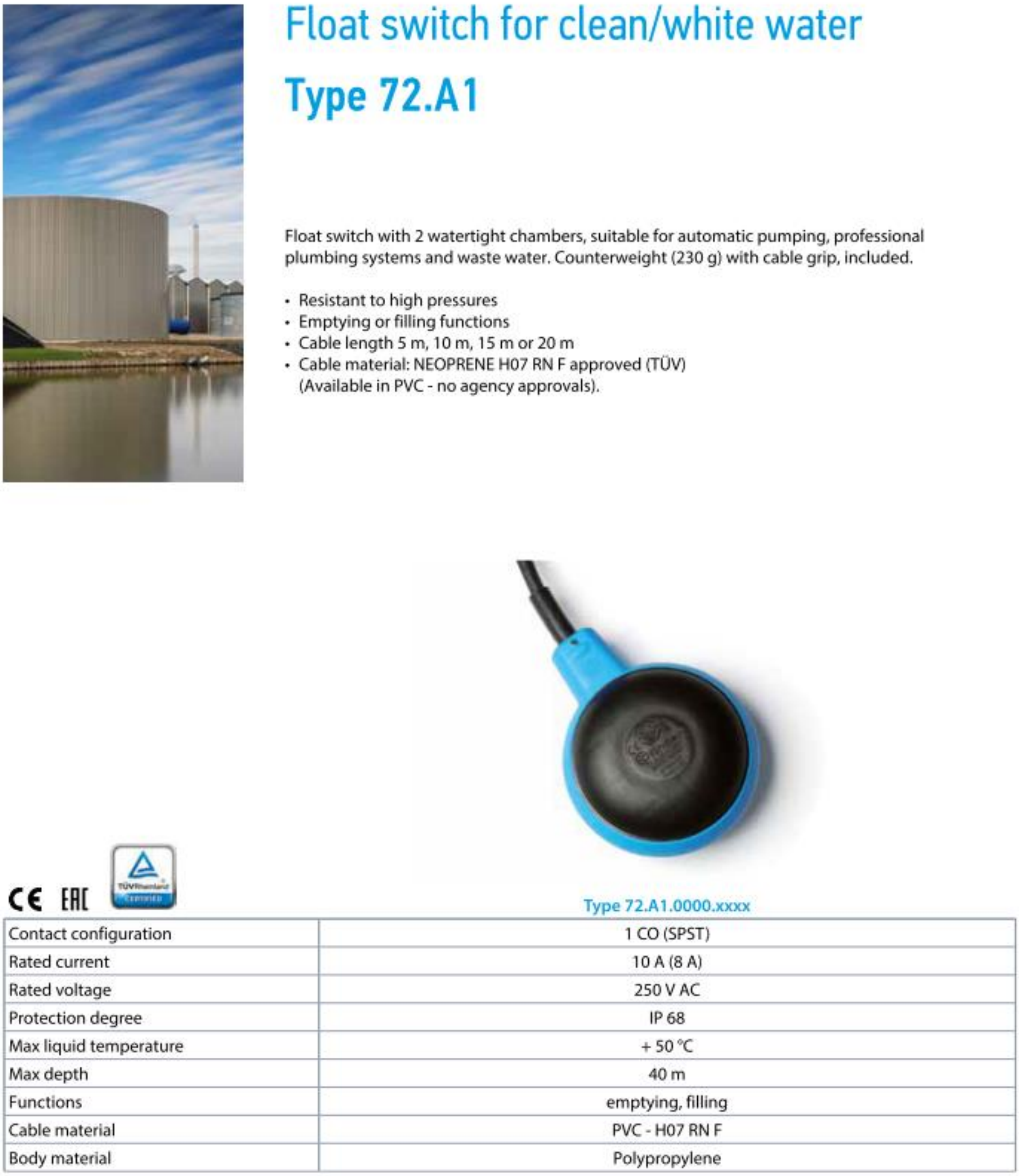




(mm)

5.12. Floating sensor for water and flocculant level (LC01 to LC05 and LC08)

77



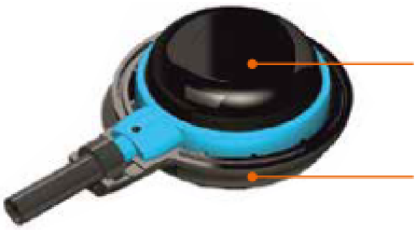
Float switch for clean/white water

Type 72.A1

Float switch with 2 watertight chambers, suitable for automatic pumping, professional plumbing systems and waste water. Counterweight (230 g) with cable grip, included.

- Resistant to high pressures
- Emptying or filling functions
- Cable length 5 m, 10 m, 15 m or 20 m
- Cable material: NEOPRENE H07 RN F approved (TÜV) (Available in PVC - no agency approvals).

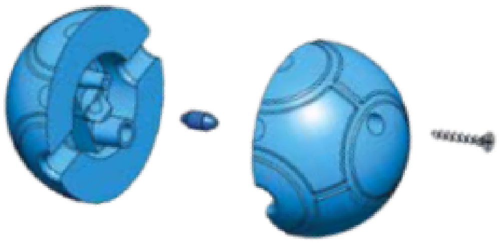
	Type 72.A1.0000.xxxx
Contact configuration	1 CO (SPST)
Rated current	10 A (8 A)
Rated voltage	250 V AC
Protection degree	IP 68
Max liquid temperature	+ 50 °C
Max depth	40 m
Functions	emptying, filling
Cable material	PVC - H07 RN F
Body material	Polypropylene



1st sealed chamber

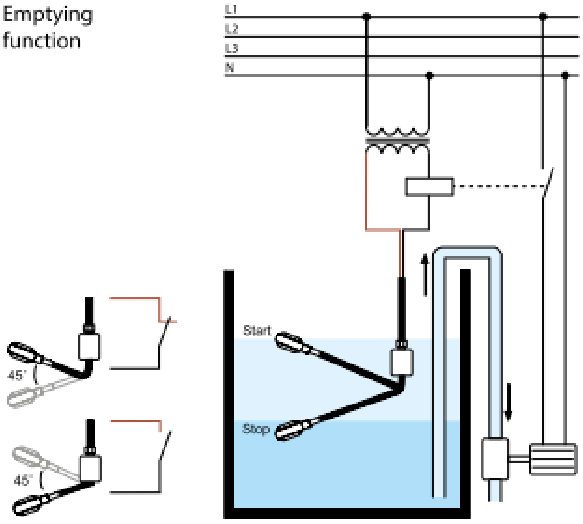
2nd sealed chamber
for true double isolation

Counterweight (230 g)
for Type 72.A1.
Included in the package.



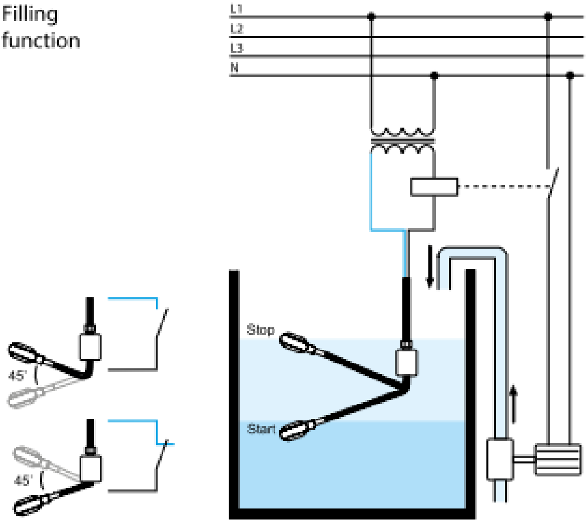
Easy to install.
Direct fixing to the cable to allow adjustment of the level and to ensure the appropriate excursion of the float - even in the case of turbulent water.

Emptying function



When black and brown wires are used, the circuit opens when the float is down and closes when the float is up.

Filling function



When black and blue/grey wires are used, the circuit opens when the float is up and closes when the float is up.

Product code	Description
72.A1.0.000.0501	Float switch, cable length 5 m in neoprene (H07 RN F)
72.A1.0.000.1001	Float switch, cable length 10 m in neoprene (H07 RN F)
72.A1.0.000.1501	Float switch, cable length 15 m in neoprene (H07 RN F)
72.A1.0.000.2001	Float switch, cable length 20 m in neoprene (H07 RN F)
72.A1.0.000.0500	Float switch, cable length 5 m in PVC
72.A1.0.000.1000	Float switch, cable length 10 m in PVC
72.A1.0.000.1500	Float switch, cable length 15 m in PVC
72.A1.0.000.2000	Float switch, cable length 20 m in PVC

5.13. Optical sensor for automatic start/stop ofwashing cycle

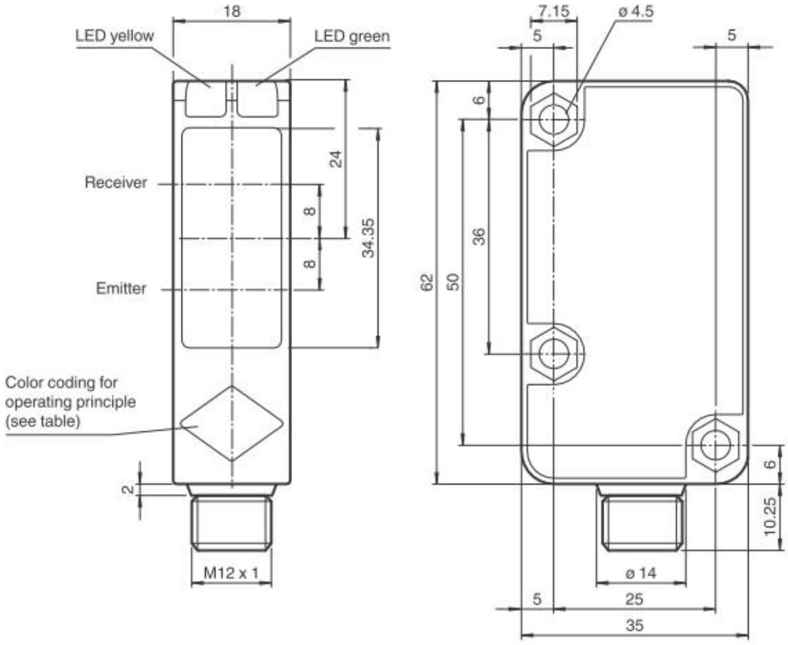
Diffuse mode sensor

RL31-8-2500-IR/73c/136

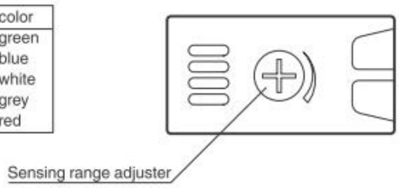
- Highly visible LED
- Powerful push-pull output
- Compact and stable housing
- Protection class II

Diffuse mode sensor, plastic housing, 2500 mm adjustable detection range, infrared light, light on, 2 push-pull outputs, M12 plug

Dimensions


18
LED yellow
LED green
Receiver
Emitter
24
8
8
34.35
Color coding for operating principle (see table)
2
M12 x 1
7.15
ø 4.5
5
5
6
36
62
50
6
10.25
ø 14
5
25
35

Operating principle	color
Retroreflective sensor with polarisation filter	green
Retroreflective sensor	blue
Diffusive mode sensor	white
Thru-beam sensor	grey
Diffusive mode sensor with background suppression	red


Sensing range adjuster

Technical Data

General specifications	
Detection range	0 ... 2500 mm adjustable

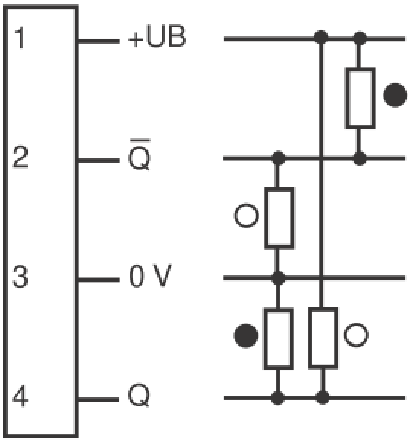
Diffuse mode sensor RL31-8-2500-IR/73c/136

Technical Data

Reference target		standard white 200 mm 200 mm
Light source		IRED
Light type		modulated infrared light , 850 nm
Polarization filter		no
Diameter of the light spot		approx. 50 mm at a distance of 2.5 m
Opening angle		2 °
Ambient light limit		50000 Lux ; according EN 60947-5-2
Functional safety related parameters		
$MTTF_d$		920 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		LED green: power on
Function indicator		LED yellow, lights up with receiver lit
Control elements		Sensing range adjuster
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC , class 2
Ripple		10 %
No-load supply current	I_0	≤ 20 mA
Output		
Switching type		light-on
Signal output		2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 1.5 V
Switching frequency	f	≤ 500 Hz
Response time		≤ 1 ms
Conformity		
Product standard		EN 60947-5-2
Approvals and certificates		
EAC conformity		TR CU 020/2011
Protection class		II , rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 Output circuit basis insulation of input circuit according to EN 50178, rated insulation voltage 240 V AC
UL approval		cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 55 °C (-22 ... 131 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Housing width		18 mm
Housing height		62 mm
Housing depth		35 mm
Degree of protection		IP67
Connection		4-pin, M12 x 1 connector
Material		
Housing		Polycarbonate
Optical face		PMMA
Mass		25 g

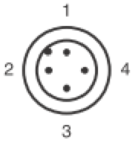
Connection Assignment

Option:



○ = Light on
● = Dark on

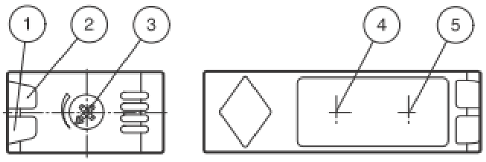
Connection Assignment



Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

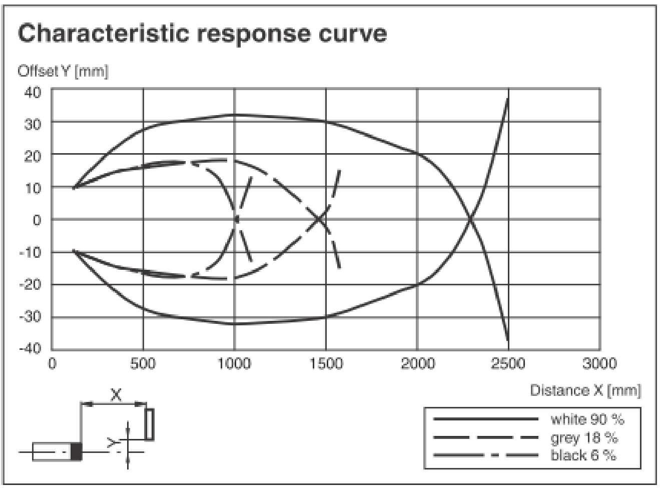
Assembly

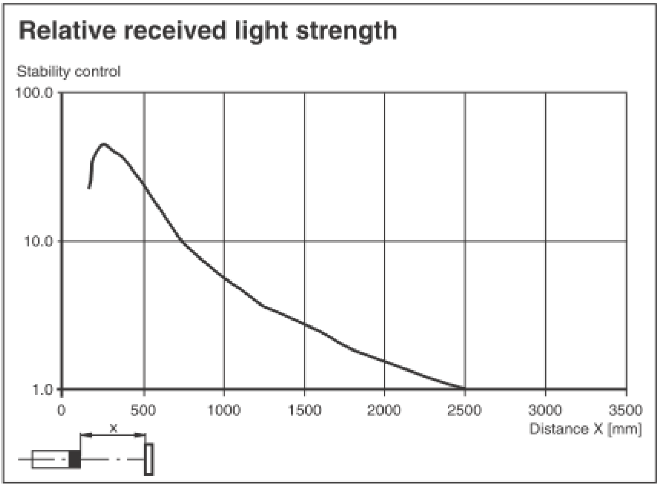


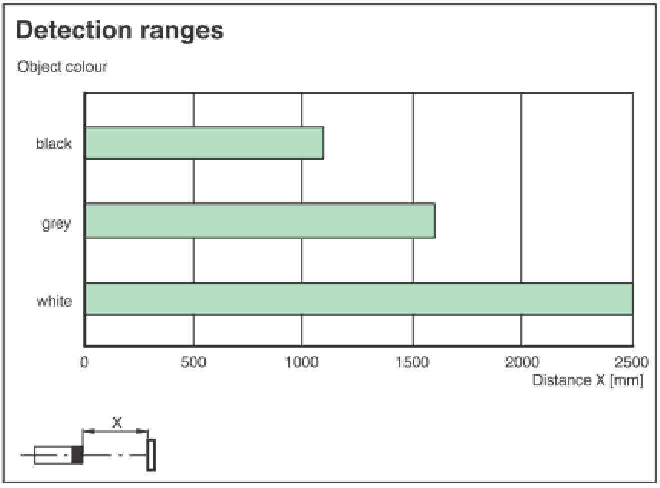
1	Operating display	green
2	Signal display	yellow
3	Sensing range adjuster	
4	Emitter	
5	Receiver	

Diffuse mode sensor RL31-8-2500-IR/73c/136

Characteristic Curve







5.14. Solenoid valve for water refilling (1D55-EVY-5501)

Solenoid valve 2/2 way N.C. With pilot control - manual operation and closing velocity control

21W3K*B*190-MR
÷
21W7K*B*500-MR

PRESENTATION:

S.V. with pilot control for interception of fluids compatible with the construction materials.
A minimum operational pressure of 0,2 bar is required.
The materials used and the tests carried out ensure maximum reliability and duration.

USE: Automation
Heating

PIPES: G 3/4 - G 2

COILS: 8W - Ø 13

BDA - BSA	155°C	(class F)
BDV	180°C	(class H)

COIL HOUSING AND COIL FORMER MATERIAL ARE MADE BY 100% VIRGIN MATERIAL.

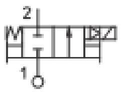
Max. allowable pressure (PS)

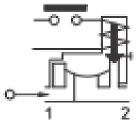
G 3/4 - G 1	25 bar
G 1 1/4 - G 2	16 bar

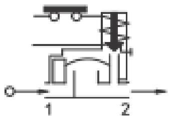
Ambient temperature:
See coils catalogue page for its compatibility.

Gaskets	Temperature		Medium
B=NBR (nitrile rubber)	- 10°C	+ 90°C	Air, inert gas, water
E=EPDM (ethylene-propylene)	- 10°C	+140°C	Water, low pressure steam
V=FKM (fluoroelastomer)	- 10°C	+140°C	Mineral oils (2°E), gasoline gas oil

For seals other than NBR replace the letter "**B**" with the ones corresponding to the other seals. E.I. 21W3**E**190-MR.

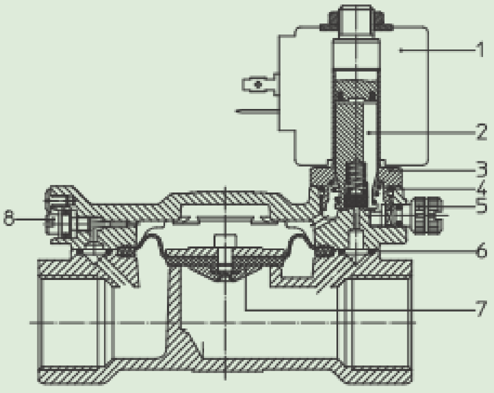






Pipe ISO 228/1	Code	Max viscosity		Ø	Kv	Power	Pressure		
							min	M.O.P.D.	
		cSt	°E	mm	l/mn	watt	bar	AC bar	DC bar
G 3/4	21W3K**B**190-MR	12	~ 2	19	140	8	0,2	16	16
G 1	21W4K**B**250-MR			25	190				
G 1 1/4	21W5K**B**350-MR			35	400			10	10
G 1 1/2	21W6K**B**400-MR			40	520				
G 2	21W7K**B**500-MR			50	750				

CE Approval
(Pressure Equipment Directive 2014/68/EU)
for EV 21W5÷21W7



MATERIALS:

Body	Brass - UNI EN 12165 CW617N
Armature tube	Stainless steel AISI series 300
Fixed core	Stainless steel AISI series 400
Plunger	Stainless steel AISI series 400
Phase displacement ring	Copper - Cu 99,9%
Spring	Stainless steel AISI series 300
Seal	Standard: B=NBR On request: E=EPDM V=FKM
Orifice	Brass - UNI EN 12165 CW617N

On request:

Connector	Pg 9 or Pg 11
Connector conformity	ISO 4400

FEATURES:

Electrical conformity	IEC 335
Protection degree	IP 65 EN 60529 (DIN 40050) with coil fitted by connector.

SPARE PARTS:

1. **Coil:**
   See coils list
2. **Complete plunger:**
   Code R450898/***B***
3. **Complete armature tube :**
   Code R450603
4. **Gasket O-Ring**
   Code R990000/***B***
5. **Manual operation:**
   Code R451772/***B***
6. **Gasket O-Ring:**
   G 3/4-G 1 Code R990002/***B***
   G 1 1/4-G 1 1/2 Code R990005/***B***
   G 2 Code R990081/***B***
7. **Complete diaphragm:**
   G 3/4-G 1 Code R450431/***B***
   G 1 1/4-G 1 1/2 Code R450466/***B***
   G 2 Code R450432/***B***
8. **Regulation screw:**
   Code R450728/***B***

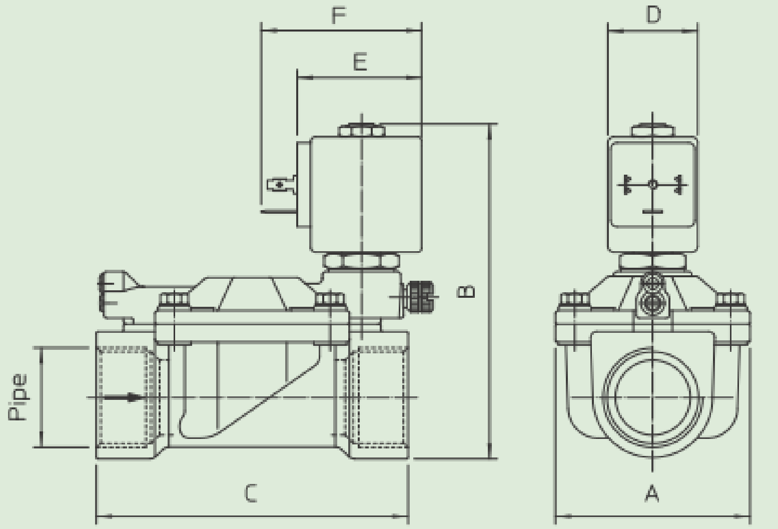
KIT:

KT130K***B***30-F= ***2+3+4***

MAINTENANCE KIT

KTG0W3K***B***19= ***2+6+7***
KTG0W5K***B***35= ***2+6+7***
KTG0W7K***B***50= ***2+6+7***

DIMENSIONS:



Type	Pipe ISO 228/1	A mm	B mm	C mm
21W3K**B**190-MR	G 3/4	65	105	104
21W4K**B**250-MR	G 1		112	
21W5K**B**350-MR	G 1 1/4	98	125	144
21W6K**B**400-MR	G 1 1/2			
21W7K**B**500-MR	G 2	118	141	172

COIL TYPE	POWER ABSORPTION			DIMENSIONS		
	W ⎓	Hold VA ~	Inrush VA ~	D mm	E mm	F mm
B	8	14,5	25	30	42	54

5.15. PLC Siemens installed on the electrical control panel

Data sheet **6ES7212-1BE40-0XB0**

SIMATIC S7-1200, CPU 1212C, compact CPU, AC/DC/relay, onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 2 AI 0-10 V DC, Power supply: AC 85-264 V AC at 47-63 Hz, Program/data memory 75 KB

General information	
Product type designation	CPU 1212C AC/DC/relay
Firmware version	V4.4
Engineering with	
• Programming package	STEP 7 V16 or higher
Supply voltage	
Rated value (AC)	
• 120 V AC	Yes
• 230 V AC	Yes
permissible range, lower limit (AC)	85 V
permissible range, upper limit (AC)	264 V
Line frequency	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz
Input current	
Current consumption, max.	240 mA at 120 V AC; 120 mA at 240 V AC
Inrush current, max.	20 A; at 264 V
I^2t	0.8 $A^2 \cdot s$
Output current	
for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
• 24 V	20.4 to 28.8V
Power loss	
Power loss, typ.	11 W
Memory	
Work memory	
• integrated	75 kbyte
• expandable	No
Load memory	
• integrated	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
Backup	
• present	Yes
• maintenance-free	Yes
• without battery	Yes
CPU processing times	

for bit operations, typ.	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction
CPU-blocks	
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
OB	
• Number, max.	Limited only by RAM for code
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	10 kbyte
Flag	
• Number, max.	4 kbyte; Size of bit memory address area
Local data	
• per priority class, max.	16 kbyte
Address area	
Process image	
• Inputs, adjustable	1 kbyte
• Outputs, adjustable	1 kbyte
Hardware configuration	
Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules
Time of day	
Clock	
• Hardware clock (real-time)	Yes
• Backup time	480 h; Typical
Digital inputs	
Number of digital inputs	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)
Source/sink input	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
for technological functions	
— parameterizable	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz
Cable length	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	300 m; for technological functions: No
Digital outputs	
Number of digital outputs	6; Relays
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	30 W with DC, 200 W with AC
Output delay with resistive load	
• "0" to "1", max.	10 ms; max.
• "1" to "0", max.	10 ms; max.

Relay outputs	
• Number of relay outputs	6
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Input ranges	
• Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	≥100k ohms
Cable length	
• shielded, max.	100 m; twisted and shielded
Analog outputs	
Number of analog outputs	0
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	10 bit
• Integration time, parameterizable	Yes
• Conversion time (per channel)	625 µs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	1
• integrated switch	No
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	No
— PROFIenergy	No
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	16
— Number of connectable IO Devices, max.	16
— Number of connectable IO Devices for RT, max.	16
— of which in line, max.	16
— Activation/deactivation of IO Devices	Yes
— Number of IO Devices that can be	8

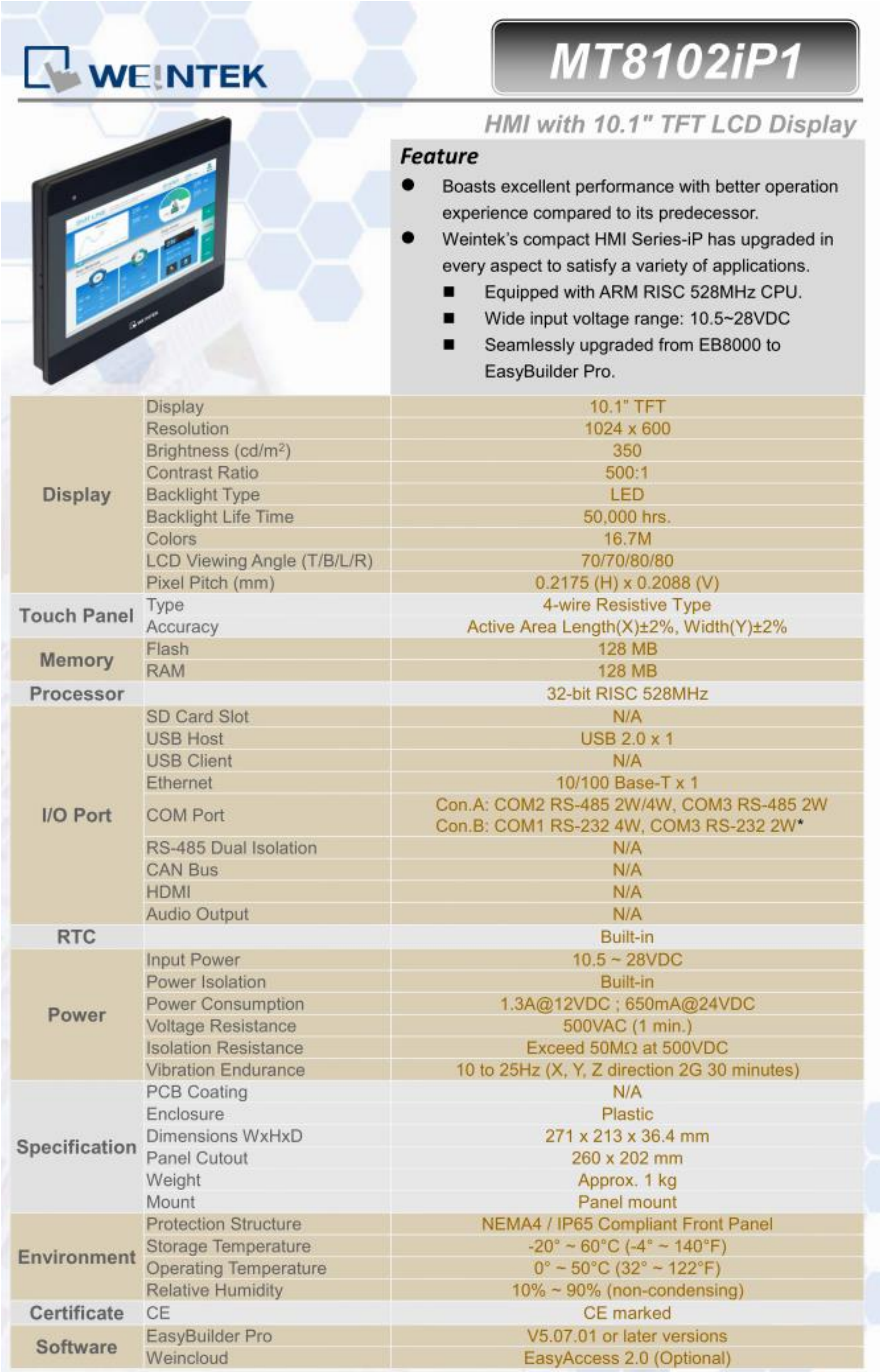
simultaneously activated/deactivated, max.	
— Updating time	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Redundancy mode	
Media redundancy	
— MRP	No
— MRPD	No
SIMATIC communication	
• S7 routing	Yes
Open IE communication	
• TCP/IP	Yes
— Data length, max.	8 kbyte
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	8 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
Web server	
• supported	Yes
• User-defined websites	Yes
OPC UA	
• Runtime license required	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
— Number of sessions, max.	5
— Number of accessible variables, max.	1 000
— Number of subscriptions per session, max.	5
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
— Number of monitored items, max.	500
— Number of server interfaces, max.	2
— Number of nodes for user-defined server interfaces, max.	1 000
Further protocols	
• MODBUS	Yes
Communication functions	
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
• User data per job, max.	See online help (S7 communication, user data size)

Number of connections	
• overall	8 connections for open user communication (active or passive): TSEND_C, TRCV_C, TCON, TDISCON, TSEND and TRCV, 8 CPU/CPU connections (Client or Server) for GET/PUT data, 6 connections for dynamic assignment to GET/PUT or open user communication
Test commissioning functions	
Status/control	
• Status/control variable	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
• Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	
• Number of configurable Traces	2
• Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
Integrated Functions	
Number of counters	6
Counting frequency (counter) max.	100 kHz
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222
PID controller	Yes
Number of alarm inputs	4
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	500V AC for 1 minute
• between the channels, in groups of	1
Potential separation digital outputs	
• Potential separation digital outputs	Relays
• between the channels	No
• between the channels, in groups of	2
EMC	
Interference immunity against discharge of static electricity	
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes
— Test voltage at air discharge	8 kV
— Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	
• Interference immunity on supply lines acc. to IEC 61000-4-4	Yes
• Interference immunity on signal cables acc. to IEC 61000-4-4	Yes
Interference immunity against voltage surge	
• Interference immunity on supply lines acc. to IEC 61000-4-5	Yes
Interference immunity against conducted variable disturbance induced by high-frequency fields	
• Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes
Emission of radio interference acc. to EN 55 011	
• Limit class A, for use in industrial areas	Yes; Group 1
• Limit class B, for use in residential areas	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011

Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
Altitude during operation relating to sea level	
• Installation altitude, min.	-1 000 m
• Installation altitude, max.	2 000 m
Relative humidity	
• Operation, max.	95 %; no condensation
Vibrations	
• Vibration resistance during operation acc. to IEC 60068-2-6	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
• Operation, tested according to IEC 60068-2-6	Yes
Shock testing	
• tested according to IEC 60068-2-27	Yes
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Cycle time monitoring	
• adjustable	Yes
Dimensions	

Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	425 g

5.16. Touch screen panel on the electrical control panel



WEINTEK

MT8102iP1

HMI with 10.1" TFT LCD Display

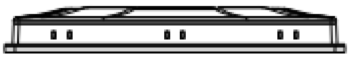
Feature

- Boasts excellent performance with better operation experience compared to its predecessor.
- Weintek's compact HMI Series-iP has upgraded in every aspect to satisfy a variety of applications.
  - Equipped with ARM RISC 528MHz CPU.
  - Wide input voltage range: 10.5~28VDC
  - Seamlessly upgraded from EB8000 to EasyBuilder Pro.

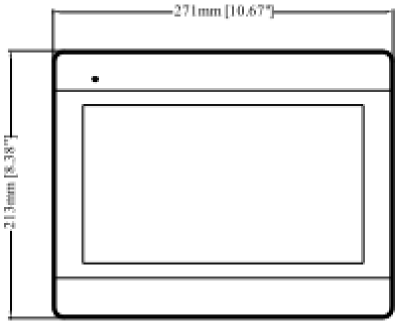
Display	Display	10.1" TFT
	Resolution	1024 x 600
	Brightness (cd/m²)	350
	Contrast Ratio	500:1
	Backlight Type	LED
	Backlight Life Time	50,000 hrs.
	Colors	16.7M
	LCD Viewing Angle (T/B/L/R)	70/70/80/80
	Pixel Pitch (mm)	0.2175 (H) x 0.2088 (V)
Touch Panel	Type	4-wire Resistive Type
	Accuracy	Active Area Length(X)±2%, Width(Y)±2%
Memory	Flash	128 MB
	RAM	128 MB
Processor		32-bit RISC 528MHz
I/O Port	SD Card Slot	N/A
	USB Host	USB 2.0 x 1
	USB Client	N/A
	Ethernet	10/100 Base-T x 1
	COM Port	Con.A: COM2 RS-485 2W/4W, COM3 RS-485 2W Con.B: COM1 RS-232 4W, COM3 RS-232 2W*
	RS-485 Dual Isolation	N/A
	CAN Bus	N/A
	HDMI	N/A
	Audio Output	N/A
RTC		Built-in
Power	Input Power	10.5 ~ 28VDC
	Power Isolation	Built-in
	Power Consumption	1.3A@12VDC ; 650mA@24VDC
	Voltage Resistance	500VAC (1 min.)
	Isolation Resistance	Exceed 50MΩ at 500VDC
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)
Specification	PCB Coating	N/A
	Enclosure	Plastic
	Dimensions WxHxD	271 x 213 x 36.4 mm
	Panel Cutout	260 x 202 mm
	Weight	Approx. 1 kg
	Mount	Panel mount
Environment	Protection Structure	NEMA4 / IP65 Compliant Front Panel
	Storage Temperature	-20° ~ 60°C (-4° ~ 140°F)
	Operating Temperature	0° ~ 50°C (32° ~ 122°F)
	Relative Humidity	10% ~ 90% (non-condensing)
Certificate	CE	CE marked
Software	EasyBuilder Pro	V5.07.01 or later versions
	Weincloud	EasyAccess 2.0 (Optional)

MT8102iP1

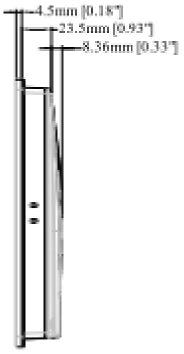
Dimensions



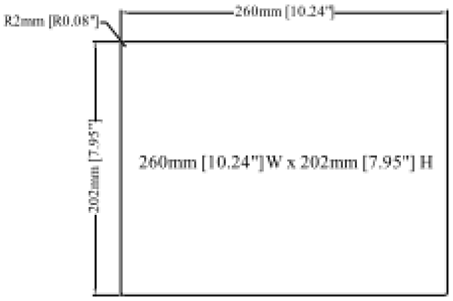
Top View


271mm [10.67"]
213mm [8.38"]

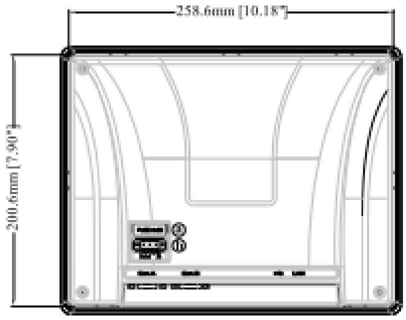
Front View


4.5mm [0.18"]
23.5mm [0.93"]
8.36mm [0.33"]

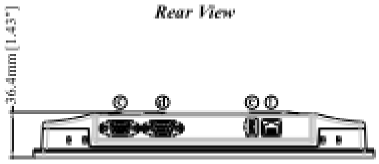
Side View


R2mm [R0.08"]
260mm [10.24"]
202mm [7.95"]
260mm [10.24"]W x 202mm [7.95"] H

Cutout Dimensions


258.6mm [10.18"]
200.6mm [7.90"]
ⓐ
ⓑ

Rear View



Bottom View

a.	Fuse
b.	Power Connector
c.	Con.A: COM2 RS-485 2W/4W, COM3 RS-485 2W
d.	Con.B: COM1 RS-232 4W, COM3 RS-232 2W
e.	USB Host Port
f.	LAN

Ordering Information

Optional:

☐ **RZACEA020:** EasyAccess 2.0 Activation Card

Pin Assignment:

Con.B: COM1 / COM3 [RS232] 9 Pin, Male, D-sub

PIN#	COM1 [RS232]4W	COM3 [RS232]2W
1		
2	RxD	
3	TxD	
4		
5	GND	
6		
7	RTS	TxD
8	CTS	RxD
9	GND	

Con.A: COM2 / COM3 [RS485] 9 Pin, Female, D-sub

PIN#	COM2 [RS485]2W	COM2 [RS485]4W	COM3 [RS485]2W
1	Data-	Rx-	
2	Data+	Rx+	
3		Tx-	
4		Tx+	
5	GND		
6			Data-
7			
8			
9			Data+

Contact: WEINTEK LABS., INC. TEL: +886-2-22286770 Web:www.weintek.com

5.17. Flocculant technical data sheet

Natural Power

PRODUCT **CLEAN – FLOC- BD**	**ISSUE DATE** **22/04/2008**	**REVISION** **-2-**	CE
SAFETY DATA SHEET **NR. 85**	**UPDATE DATE** **11/10/2021**	PAGE 1	

TECHNICAL DATA OF ProdUCT: CLEAN - FLOC- BD

(Conform with the Regulations CE n. 1907/2006, CE n. 1272/2008 ed EU n. 453/2010)

Product: Organic cationic polyacrylamide in water/oil emulsion mod. CLEAN – FLOC- BD

PROPERTY 'AND APPLICATIONS:

The product is used in the conditioning of sewage sludge and of organic and inorganic, in the treatment of process waters of all industrial sectors, in the processes of filtrazione- mechanical dehydration (filter press, belt-press, centrifuge, etc.), in preispessimento of biological sludge to be sent to anaerobic digestion processes, as a flocculant in the treatment of clear-flocculation (flotation, etc.).
The use of this polyelectrolyte ensures an increase in the sedimentation rate, improves the clarified, it decreases the times of filtration by increasing the production of dehydrated sludge, increases the dry of the dehydrated sludge, improves the clarity of the filtrate.

PHYSICAL PROPERTIES:

Appearance:	viscous liquid
Color:	Matt white
Odor:	Nobody
Anionic charge:	Cationic
Density at 25°C:	1,04 Kg/l
Viscosity:	1.200 cP
Concentration in active material:	46-50%
Concentration of dissolution recommended (g/l):	2 - 8
Maximum concentration of dissolution (g/l):	10
Stability of the product (such, at 25 ° C):	6 months
Storage temperature:	0 – 35 °
Acrylamide residual standard:	<0,1%

METHOD OF USE:

The dosage of the product, solubility in water (Recommended maturation times of 20-30 minutes), being subject to many variables, must be checked from time to time through laboratory tests according to the various applications. A recommended dosage can be as follows:

Thickening-sedimentation-flotation:	1-30 ppm
Dehydration:	3-12 Kg. Of flocculant / Ton. SST

PRODUCT CLEAN – FLOC- BD	ISSUE DATE 22/04/2008	REVISION -2-	CE
SAFETY DATA SHEET NR. 85	UPDATE DATE 11/10/2021	PAGE 2	

PACKING AND STORAGE:

The product is supplied in tank of 25 kg and in tanks of 1000 kg. With the original package has a duration of more than six months, once the package has been opened it is essential to tightly seal the container to maintain the stability of the product.
Store in a dry place at a temperature below 35 ° C. Protect from frost.

SHAKE THE PRODUCT BEFORE USE

5.18. Flocculant safety data sheet

Natural Power

PRODUCT CLEAN - FLOC- BD	ISSUE DATE 22/04/2008	REVISION 02	CE
SAFETY DATA SHEET NR. 96	UPDATE DATE 11/10/2021	PAGE 1	

SAFETY DATA SHEET of Product: CLEAN - FLOC- BD

Conform with the Regulations (UE) N.453/2010

1) IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

- Trade name:	**CLEAN - FLOC- BD**

1.2 Relevant identified uses of the substance or mixture and uses advised against

- Recommended use	Processing aid for industrial applications

1.3 Details of the supplier of the safety data sheet

- Company:	Clean S.r.l. Via Borgo Padova, 64 35012 Camposampiero (PD) Italia Tel. 049/9300500 Fax. 049/9320042 clean@clean-impianti.it
- Competent person responsible for the safety data sheet:	Sig. Luigino Prosdocimi

1.4 Emergency telephone number

Antipoison Centre Azienda Ospedaliera Papa Giovanni XXIII - BERGAMO - tel. 800 883300 24h/24h service Italian and English
Centro antiveleni del Policlinico Universitario "A. Gemelli" - Roma - tel. +39 06 3054343 Istituto Superiore di Sanità - Roma tel. +39 06 49901

2) HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP)
The product is not classified as dangerous according to Regulation EC 1272/2008 (CLP).
Adverse physicochemical, human health and environmental effects: No other hazards

2.2 Label elements

The product is not classified as dangerous according to Regulation EC 1272/2008 (CLP)
Hazard pictograms: None
Warning: None
Indications of danger: None
Precautionary statements: None
Special Provisions: EUH210 Safety data sheet available on request.
Special provisions according to Annex XVII of REACH and subsequent amendments: None

2.3 Other hazards

vPvB Substances: None

PBT Substances: None

Other Hazards: No other hazards

Note: the mixture does not require classification as its kinematic viscosity is > 20,5 mm2/s at 40°C

3) COMPOSIZIONE/INFORMAZIONI SUGLI INGREDIENTI:

3.1 Substances: n.a.
3.2 Mixtures: n.a.

Hazardous components within the meaning of the CLP regulation and related classification:

Qty	Name	Ident. Number	Classification	Additional info
20-45 %	Idrocarburi, C12-15, n-alcani, isoalcani, ciclici, <2% aromatici	EC: 920-107-4R EACH No.: 01-211945 3414-43-****	◆ 3.10/1 Asp. Tox. 1 H304	Note REACH: N.A.
< 3 %	Isotridecanolo, etossilati		◆ 3.1/4/Oral Acute Tox. 4 H302 ◆ 3.3/1 Eye Dam. 1 H318	Note REACH: N.A.

4) FIRST AID MEASURES

4.1 Description of first aid measures

In case of skin contact: Wash with plenty of water and soap.
In case of eyes contact: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
In case of Ingestion: Do not under any circumstances induce vomiting. OBTAIN A MEDICAL EXAMINATION IMMEDIATELY.
In case of Inhalation: Remove casualty to fresh air and keep warm and at rest.

4.2 Most important symptoms and effects, both acute and delayed: None

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: None

5) FIREFIGHTING MEASURES:

5.1 Extinguishing media

Suitable extinguishing media:
Extinguishing media which must not be used for safety reasons: None

5.2 Special hazards arising from the substance or mixture: Do not inhale explosion and combustion gases. Burning produces heavy smoke.

5.3 Advice for firefighters: Use suitable breathing apparatus. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Move undamaged containers from immediate hazard area if it can be done safely.

6) ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment. Move people to a safe place. See protective measures under point 7 and 8.

6.2 Environmental precautions

Prevent penetration into the soil and subsoil. Prevent runoff into surface water or water sewerage. Retain contaminated washing water and dispose of it. In the event of a gas leak or enters watercourses, soil or sewage system inform the responsible authorities. Material suitable for collection: absorbent material, organic, sand.

6.3 Methods and material for containment and cleaning up

For containment: contain the spill with absorbent material, collect the material spilled and store it in containers for disposal.
For reclamation: Small sheds: Do not wash or flush with water. absorb with inert material. Mechanically harvest.
Large spills: Do not wash or flush with water. Remove immediately for means of a broom or with half suction. After removal, rinse residues with water

6.4 Reference to other sections

See also section 8 and 13

7) HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. During the preparation of the working solution ensure adequate ventilation. Do not smoke or drink during use.
Please also refer to section 8 for recommended protective equipment

7.2 Conditions for safe storage, including any incompatibilities

Storage and container requirements: Store in a dry, cool place (0 - 30°C). Hold away from heat sources and other causes of fire. Freezing affects the physical condition and May damage the material.
Indications for mixed storage: No data available.
Additional storage information: Properly ventilated rooms.

7.3 Specific end use(s) no data available
Expiration: the product has a maximum shelf life of three months.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Idrocarburi, C12-15, n-alcani, isoalcani, ciclici, <2% aromatici
OEL Type: National - TWA(8h): 200 mg/m3
DNEL Exposure Limit Values N.A.
PNEC Exposure Limit Values N.A.

8.2 Exposure

Eye protection: glasses with side protection.
Skin protection: Full protective garment.
Hand protection: Full protective garment.
Respiratory protection: Not needed for normal use.
Thermal Hazards: None
Environmental exposure controls: avoid uncontrolled disposal of the product in the environment. Do not drain the washing liquid into open water.

Suitable technical controls: Natural ventilation is adequate in the absence of dust. Use a local equipped with suction in case of dust.

9) PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on fundamental physical and chemical properties

General information
Aspect:
Form: viscous liquid
Color: milky
Odour: aliphatic
Olfactory threshold: not available
pH values at 20°C: 4-6 @5 g/l
Melting point/freezing point: < 5 °C
Initial boiling point and boiling range: > 100 °C
Flash Point: non-flammable
Evaporation rate: no data available
Flammability (solids and gases): no data available
Upper/lower flammability or explosive limits: not expected to create atmospheres explosive
Vapour pressure: 2,3 kPa @ 20°C
Vapour density: 0,804 g/liter @ 20°C
Relative density: 1,0-1,1 kg/l
Solubility: see data sheet
Partition coefficient n-octanol/water: no data available
Auto-ignition temperature: no data available
Decomposition temperature: > 150 °C
Viscosity: >20,5 mm2/s @40°C (kinematics)
Explosive properties: not expected to be explosive
Oxidizing properties: it should not be oxidizing, based on the chemical structure

10) STABILITY AND REACTIVITY

10.1 Reactivity: Stable when stored by observing recommendations

10.2 Chemical stability: Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions: None

10.4 Conditions to avoid: stable under normal conditions, avoid overheating, keep away from the light, it fears frost.

10.5 Incompatible materials: oxidizing agents.

10.6 Hazardous decomposition products: Thermal decomposition can generate: gas, acid hydrochloric, nitrogen oxides (NOx), carbon oxides (COx). Hydrogen cyanide (hydrocyanic acid) They can be produced in case of combustion in an atmosphere deficient in oxygen.

11) TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Toxicological information concerning the product:

a) acute toxicity:
Not classified
Based on available data, the classification criteria are not met
Test: LD50 - Route: Oral - Species: Rat > 5000 mg/kg Notes: APPRAISED
Test: LD50 - Route: Skin - Species: Rat > 5000 mg/kg Notes: APPRAISED

b) skin corrosion/irritation:
Not classified
Based on available data, the classification criteria are not met

c) serious eye damage/irritation:
Not classified
Based on available data, the classification criteria are not met

d) respiratory or skin sensitisation:
Not classified
Based on available data, the classification criteria are not met

e) germ cell mutagenicity:
Not classified
Based on available data, the classification criteria are not met

f) carcinogenicity:
Not classified
Based on available data, the classification criteria are not met

g) reproductive toxicity:
Not classified
Based on available data, the classification criteria are not met

h) STOT-single exposure
Not classified
Based on available data, the classification criteria are not met

i) STOT-repeated exposure:
Not classified
Based on available data, the classification criteria are not met

j) aspiration hazard:
Not classified
Based on available data, the classification criteria are not met.

Toxicological information of the main substances found in the product:
Idrocarburi, C12-15, n-alcani, isoalcani, ciclici, <2% aromatici

a) acute toxicity:
Test: LC50 - Route: Inhalation - Species: Rabbit = 4951 mg/m3 - Duration: 4h
Test: LD50 - Route: Oral - Species: Rat > 5000 mg/kg
Test: LD50 - Route: Skin - Species: Rabbit > 5000 mg/kg

g) reproductive toxicity:
Test: NOEL - Species: Rat = 300 ppm
i) STOT- specific target organ toxicity - repeated exposure:
Test: NOAEL - Route: Oral - Species: Rat >= 3.000 mg/kg/d - Duration: 90d

Isotridecanol, ethoxylates
a) acute toxicity:
Test: LD50 - Route: Oral - Species: Rat = 500 mg/kg
Test: LD50 - Route: Skin - Species: Rabbit > 2000 mg/kg
g) reproductive toxicity:
Test: NOEL - Species: Rat > 250 mg/kg/d
Test: NOEL - Species: Rat > 50 mg/kg/d
Test: NOEL - Species: Rat > 50 mg/kg/d
i) STOT- Specific target organ toxicity - repeated exposure:
Test: NOAEL - Route: Oral - Species: Rat = 50 mg/kg/d - Duration: 600d

12) ECOLOGICAL INFORMATION

12.1 Toxicity:

Adopt good working practices, so that the product is not released into the environment.
Not classified for environmental hazards
a) Aquatic acute toxicity:
Endpoint: LC50 - Species: Fish = 10 mg/l - Duration h: 96 - Notes: APPRAISED
Endpoint: EC50 - Species: Daphnia = 10 mg/l - Duration h: 48 - Notes: APPRAISED
Species: Algae > 100 mg/l - Duration h: 72 - The algae inhibition test is not applicable. The flocculant characteristic of the product directly interferes with the method and prevents determination of values.

Hydrocarbons, C12-15, n-alkanes, isoalkanes, cyclics, <2% aromatics
a) Aquatic acute toxicity:
Endpoint: LC0 - Species: Fish > 1000 mg/l - Duration h: 96
Endpoint: CE0 - Species: Daphnia > 1000 mg/l - Duration h: 48
Endpoint: IC0 - Species: Algae > 1000 mg/l - Duration h: 72
b) Aquatic chronic toxicity:
Endpoint: NOEC - Species: Fish > 1000 mg/l - Duration h: 672
Endpoint: NOEC - Species: Daphnia > 1000 mg/l - Duration h: 504
c) Toxicity for microorganisms:
Endpoint: EC50 - Species: Aquatic organisms > 1000 mg/l - Duration h: 48
Isotridecanol, ethoxylates
a) Aquatic acute toxicity:
Endpoint: LC50 - Species: Fish = 1 mg/l - Duration h: 96
Endpoint: EC50 - Species: Daphnia = 1 mg/l - Duration h: 48
Endpoint: EC14 - Species: Algae = 1 mg/l - Duration h: 72
b) Toxicity for microorganisms:
Endpoint: EC10 - Species: Activated sludge > 10.000 mg/l - Duration h: 17 -Notes: DIN 38412-8

12.2 Persistence and degradability

Biodegradability: not quickly degradable
Biodegradability: hydrolysis – Does not hydrolyze
Hydrocarbons, C12-15, n-alkanes, isoalkanes, cyclics, <2% aromatics
Biodegradability: Rapidly degradable - Test: OECD 301 F - Lifetime: 28d - %: 67.6
Biodegradability: Rapidly degradable - Test: OECD 306 - Lifetime: 28d - %: 68.8
Biodegradability: Rapidly degradable - Test: OECD 304 A - Lifetime: 61d - %: 61.2
Biodegradability: hydrolysis - Notes: Does not hydrolyze
Isotridecanol, ethoxylates
Biodegradability: biodegradable - Lifetime: 28d - %: 60 - Notes: OECD 301 B
Biodegradability: hydrolysis - Notes: Does not hydrolyze

12.3 Bioaccumulation potential:

Improbable
Hydrocarbons, C12-15, n-alkanes, isoalkanes, cyclics, <2% aromatics
Test: Log Pow 3-6
Isotridecanol, ethoxylates
Test: Log Pow 3 - Notes: > 3

12.4 Mobility in soil

Isotridecanolo, etossilati
Test: Koc 5000 - Note: > 5000

12.5 Results of PBT and vPvB assessment

vPvB Substances: None
PBT Substances: None

12.6 Other adverse effects

None

13) DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Recover if possible. Operate according to applicable local and national regulations.
Additional disposal information: rinse thoroughly with water and use the same for the preparation of the working solution. Dispose of in accordance with local regulations and National. It can be sent to landfill or incinerated when legislation allows.

14) TRANSPORT INFORMATION

14.1 ONU number

Not classified as dangerous in the meaning of transport regulations.

14.2 ONU proper shipping name

N.A.

14.3 Transport hazard class(es)

N.A.

14.4 Packing group

N.A.

14.5 Environmental hazards

ADR-Enviromental Pollutant:	No
IMDG-Marine pollutant:	No

14.6 Special precautions for user

N.A.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

N.A.

15) REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

D.Lgs. 9/4/2008 n. 81
D.M. Lavoro 26/02/2004 (Occupational exposure limit values)
Regulation (EC) n. 1907/2006 (REACH)
Regulation (EC) n. 1272/2008 (CLP)
Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013
Regulation (EU) 2015/830
Regulation (EU) n. 286/2011 (ATP 2 CLP)
Regulation (EU) n. 618/2012 (ATP 3 CLP)
Regulation (EU) n. 487/2013 (ATP 4 CLP)
Regulation (EU) n. 944/2013 (ATP 5 CLP)
Regulation (EU) n. 605/2014 (ATP 6 CLP)
Regulation (EU) n. 2015/1221 (ATP 7 CLP)
Regulation (EU) n. 2016/918 (ATP 8 CLP)
Regulation (EU) n. 2016/1179 (ATP 9 CLP)
Regulation (EU) n. 2017/776 (ATP 10 CLP)
Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:
Restrictions related to the product: No restriction.
Restrictions related to the substances contained: No restriction.
Where applicable, refer to the following regulatory provisions:
Ministerial Circulars 46 and 61 (Aromatic amines).
Directive 2012/18/EU (Seveso III)
Regulation (EU) n. 528/2012 (Biocidal products).
Regulation (EU) nr 648/2004 (detergents).

D.L. 3/4/2006 n. 152 Environmental standards
Dir. 2004/42/EC (VOC directive)
Provisions related to directive EU 2012/18 (Seveso III):

Seveso III category according to Annex 1, part 1
None

Notes:

All components of this product have been registered or are pre-registered with ECHA or are exempted from the registration requirement. A chemical safety assessment was conducted by the manufacturer. All relevant information used for this assessment are included in this safety data sheet.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for the mixture. Substances for which a Chemical Safety Assessment has been carried out: None

16) OTHER INFORMATION

The data are reported on the basis of our current knowledge. However, they do not represent any guarantee of the characteristics of the product and do not justify any contractual legal relationship.

Relevant phrases:
H304 May be fatal if swallowed and enters airways.
H302 Harmful if swallowed.
H318 Causes serious eye damage.

Hazard class andhazard category	Code	Description
Acute Tox. 4	3.1/4/Oral	Acute toxicity (oral), Category 4
Asp. Tox. 1	3.10/1	Aspiration hazard, Category 1
Eye Dam. 1	3.3/1	Serious eye damage, Category 1

Abbreviations and acronyms:

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging.
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GefStoffVO:	Ordinance on Hazardous Substances, Germany.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
INCI:	International Nomenclature of Cosmetic Ingredients. KSt: Explosion coefficient.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWA:	Time-weighted average
WGK:	German Water Hazard Class.

Note to user:

The information contained in this sheet is based on the knowledge available from us at the Date of the last version. The user must ensure the suitability and completeness of the information in relation to the specific use of the product.
This document should not be interpreted as a guarantee of any specific property of the product.
Since the use of the product does not fall under our direct control, it is the user's obligation observe under its own responsibility the laws and regulations in force on hygiene and safety. They do not assume responsibility for improper use.

6.Specific manuals of devices installed

6.1. Pump’s manual

Please refer to ATTACHMENT 01 at this manual – document “A5015/A5016-ALL01”

6.2. Deoiling System’s manual

Please refer to ATTACHMENT 02 at this manual – document “A5015/A5016-ALL02”

6.3. Flocculant dosing pump’s manual (55-Z-001/P09)

Please refer to ATTACHMENT 03 at this manual – document “A5015/A5016-ALL03”

6.4. Both coagulant and neutralizing dosing pump’s manual (55-Z-001/P10/P11)

Please refer to ATTACHMENT 04 at this manual – document “A5015/A5016-ALL04”

6.5. PH controller SPR40 + PH probes

Please refer to ATTACHMENT 05 at this manual – document “A5015/A5016-ALL05”

6.6. Cooling system of the container

Please refer to ATTACHMENT 06 at this manual – document “A5015/A5016-ALL06” clean®

Natural Power

ATTACHMENT 01

ZENIT
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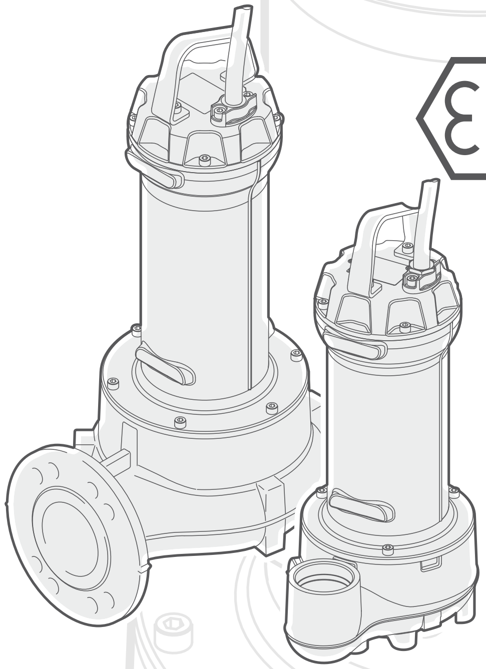
SERIES
Grey



Elettropompe sommergibili
Submersible electric pumps
Électropompes submersibles
Tauchmotorpumpen
Electrobombas sumergibles
Погружные электронасосы

IT	Manuale per installazione e uso sicuro
EN	Safety, Installation and Operations Manual
FR	Manuel d’installation et d’utilisation en toute sécurité
DE	Handbuch für die Installation und den sicheren Betrieb
ES	Manual de instalación y uso seguro
RU	Руководство по установке и безопасной эксплуатации

ATTACHMENT 01

IT *Le immagini sono puramente indicative e potrebbero non corrispondere all'aspetto reale del prodotto. I dati riportati potrebbero differire da quelli reali. Zenit si riserva la facoltà di apportare modifiche al prodotto senza alcun preavviso.*
Per ulteriori informazioni consultare il sito www.zenit.com.

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EN DATA LABEL
FR ETIQUETTE D'IDENTIFICATION

DE MARKENETIKETT
ES ETIQUETA DE IDENTIFICACIÓN
RU ЭТИКЕТКА С ПАСПОРТНЫМИ ДАННЫМИ

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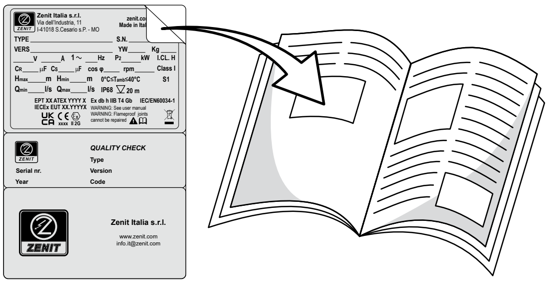
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Via dell'Industria, 11
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IECEx EUT XX.YYYYX
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IEC/EN60034-1
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA
CE xxxx
Ex II 2G
QUALITY CHECK
Serial nr.
Year
Type
Version
Code
Zenit Italia s.r.l.
www.zenit.com
info.it@zenit.com

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Per una corretta installazione ed un uso sicuro del prodotto, leggere con attenzione questo manuale e conservarlo con cura in un luogo facilmente accessibile e pulito per eventuali futuri riferimenti.
Un uso improprio del prodotto può provocare danni anche gravi a cose e a persone, causare un funzionamento anomalo e fare decadere la garanzia.

1. INFORMAZIONI GENERALI

1.1 Identificazione del costruttore
ZENIT Italia s.r.l. - via dell'Industria, 11 - 41018 S.Cesario sul Panaro (MO) - Italia

1.2 Significato della simbologia utilizzata nel manuale

⚠	Attenzione - Pericolo per la sicurezza degli operatori e la salvaguardia dell'elettropompa
⚡	Attenzione - Presenza di rischio di natura elettrica
♨	Attenzione - Presenza di superfici molto calde con pericolo di ustioni
Ex	Attenzione - Istruzioni che riguardano i modelli con certificazione -Ex. La mancata osservanza di queste istruzioni può causare pericolo di esplosione. Si raccomanda di seguire queste istruzioni anche per i modelli standard.
ATTENZIONE!	Informazione importante a cui dedicare particolare attenzione

⚠ 1.3 Avvertenze generali di sicurezza
- L'apparecchiatura non è idonea all'utilizzo da parte di persone incompetenti e/o inesperte; tenere fuori dalla portata dei bambini;
- Le operazioni di installazione devono essere eseguite da personale tecnico competente e in grado di comprendere il contenuto del manuale. Il personale addetto a installazione e manutenzione del prodotto deve essere formato sui rischi residui correlati alle apparecchiature elettriche;
- Accertarsi che le persone non possano cadere accidentalmente nel serbatoio; installare eventualmente un coperchio o una ringhiera di protezione;
- Durante le operazioni di movimentazione, installazione o disinstallazione l'apparecchiatura deve essere scollegata dall'alimentazione elettrica;
- Prestare attenzione al rischio rappresentato da gas e vapori all'interno dell'area di lavoro;
- Non ingerire né inalare alcun componente dell'apparecchiatura;
- Persone e animali non devono immergersi né venire a contatto con il liquido finché l'elettropompa non sia stata estratta dalla vasca;
- Non mettere a contatto l'estremità libera del cavo elettrico con qualsiasi liquido;
- L'impianto elettrico deve presentare un'efficiente connessione di terra;
- Prima di collegare l'alimentazione accertarsi che l'apparecchiatura sia installata correttamente e portarsi a una distanza di sicurezza;
- Non utilizzare l'apparecchiatura per scopi diversi da quelli per i quali è stata progettata e costruita poiché il costruttore non risponde di danni a persone o cose procurati dall'apparecchiatura se utilizzata in modo difforme da quanto descritto nel manuale, o nel caso non siano rispettate le prescrizioni di manutenzione e sicurezza; prima dell'installazione in ambienti chimicamente aggressivi, contattare il costruttore per verificare la compatibilità dei materiali;
- Non modificare per alcun motivo l'elettropompa o parti di essa (attacchi, forature, finiture, ecc...);
- L'utilizzatore deve attenersi alle norme di sicurezza vigenti nel paese di utilizzo, oltre che alle regole dettate dal comune buonsenso, e assicurarsi che siano effettuate correttamente le operazioni periodiche di pulizia e manutenzione;
- L'installatore ha l'obbligo di verificare le corrette condizioni ambientali d'utilizzo in modo da garantire la sicurezza e l'igiene.
- Le responsabilità del personale autorizzato all'uso del prodotto sono delegate al cliente;

1.4 Formazione del personale addetto ad installazione e manutenzione
Il personale addetto ad installazione e manutenzione del prodotto deve essere istruito sui rischi non eliminabili correlati alle apparecchiature elettriche che lavorano a contatto con liquidi biologici.
Deve, inoltre, essere in grado di leggere e comprendere il contenuto della documentazione tecnica allegata al prodotto e in particolare degli schemi elettrici di collegamento.

1.5 Dispositivi di protezione individuale (dpi) da utilizzare
Maneggiare l'elettropompa con dispositivi di protezione individuale a norma;
È' obbligatorio l'uso di guanti di protezione, scarpe antinfortunistiche, occhiali protettivi con i lati chiusi e grembiule in cuoio.
Prima di maneggiare il prodotto già installato, lavarlo abbondantemente con acqua corrente e/o detergenti.

1.6 Rischi residui
Il prodotto è stato progettato e costruito per garantire un utilizzo sicuro e affidabile.
Tuttavia, poichè esso è destinato all'uso con liquidi pericolosi per la salute, il personale addetto all'installazione e manutenzione deve prestare la massima attenzione e utilizzare sempre dispositivi di protezione individuale a norma.
Durante tutti gli interventi sul prodotto si raccomanda di impedire qualsiasi caduta accidentale dell'elettropompa e di non sottovalutare i pericoli di ustione, folgorazione, annegamento e soffocamento o avvelenamento per inalazione di gas tossici.

⚡ ⚠ Ex **Per ridurre i rischi legati alle fulminazioni, è a cura dell'utilizzatore l'installazione di eventuali ed adeguate misure di protezione contro i fulmini.**
I giunti -Ex non devono essere riparati.
Non aprire l'apparecchiatura in presenza di atmosfere esplosive

Durante le operazioni di movimentazione, installazione o disinstallazione, l'elettropompa deve essere scollegata dal quadro di alimentazione.

1.7 Descrizione del prodotto / Destinazioni d'uso

Questi prodotti sono destinati all'uso in impianti di depurazione e stazioni di sollevamento in installazioni civili, industriali e municipali.
Sono idonei al sollevamento e alla movimentazione di fanghi, materiale fecale e acque pulite, reflue e cariche con corpi solidi o fibrosi.

Non possono essere utilizzati con liquidi per uso alimentare e in atmosfere potenzialmente esplosive (ad eccezione dei modelli con certificazione antideflagrante).

Le pompe sommergibili serie Grey non devono essere mai utilizzate per pompare liquidi esplosivi, infiammabili o combustibili.

I modelli -Ex sono certificati per l'uso in atmosfera potenzialmente esplosiva secondo la stringa di marcatura riportata in targa (v. paragrafo 1.12)

Questa elettropompa deve essere fissata ad un supporto o installata in un ambiente specifico. Non è progettata per essere tenuta in mano durante l'uso.
I motori delle pompe Grey sono sempre forniti da ZENIT con un cavo flessibile per l'alimentazione, il controllo e i circuiti di monitoraggio. Il pressacavo assicura la tenuta stagna e la funzione anti-strappo per garantire un'installazione sicura. Non sono richiesti elementi aggiuntivi a corredo dell'apparecchiatura. Il collegamento all'impianto e il quadro elettrico sono a cura del cliente e devono essere idonei alle caratteristiche dell'apparecchiatura.

Le pompe sommergibili serie Grey sono classificate in base al tipo di idraulica.

- Modelli DGG: pompe sommergibili con girante vortex arretrata e ampio passaggio libero
  Applicazioni: liquidi biologici carichi e fognari in impianti di sollevamento civili e industriali, impianti di trattamento acque reflue e allevamenti zootecnici;
- Modelli DRG: pompe sommergibili con girante a canali
  Applicazioni: reflui industriali e acque di processo, sollevamenti civili, drenaggio e sollevamento di acque reflue da vasche di prima pioggia;
- Modelli GRG: pompe sommergibili con girante multi-canale e sistema di triturazione
  Applicazioni: sollevamento di liquidi contenenti fibre o corpi filamentosi in applicazioni professionali e industriali o allevamenti zootecnici
- Modelli APG: pompe sommergibili con girante multi-canale ad alta prevalenza
  Applicazioni: sollevamento di acque chiare e sabbiose, meteoriche e di infiltrazione

1.7.1 Identificazione del modello

La pompa può essere identificata attraverso i campi TYPE e VERS riportati sulla targa. Vedere paragrafo 1.12

Tipo

DGG 300/2/G65V C0ET5
(A) (B) (C)
① ② ③ ④ ⑤⑥⑦⑧⑨

① Tipo girante
  DG = Vortex
  DR = A canali
  GR = Trituratrice
  AP = Ad alta prevalenza
② Serie
  G = Grey
③ Potenza (HPx100) / poli motore
④ Mandata
  (A) TIPO (Filetto GAS/Flangia)
  (B) DIAMETRO (mm)
  (C) POSIZIONE
  V = verticale, H = orizzontale
⑤ Variante idraulica
⑥ Versione idraulica
⑦ Taglia motore
⑧ Fasi motore
  M = Monofase, T = Trifase
⑨ Frequenza
  5 = 50Hz, 6 = 60Hz

Versione

TS 10 400 D EX NN GG
⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Variante elettrica
⑪ Lunghezza cavo (m)
⑫ Tensione nominale
⑬ Avviamento
  D = DOL (diretto)
  Y = star/delta
⑭ Certificazione
  NN = standard
  EX = ATEX, ATEX + IECEx
  CX = IECEX
⑮ Personalizzazioni
⑯ Materiale girante

1.8 Dati tecnici

Le caratteristiche e i dati tecnici del prodotto sono riportati sulla scheda tecnica.
La seguete tabella mostra i tipi di involucro in relazione alle dimensioni del motore

Versione MONOFASE

Tipo	Descrizione _②③_⑦⑧_	P2 (kW)/ poli
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

Versione TRIFASE

Tipo	Descrizione _②③_⑦⑧_	P2 (kW)/ Poli
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

Versione TRIFASE

Tipo	Descrizione _②③_⑦⑧_	P2 (kW)/ Poli
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

1.9 Condizioni operative

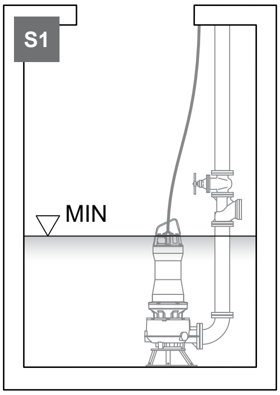
Per un uso corretto della pompa, rispettare le seguenti condizioni operative:

- Temperatura liquido/ambiente: 0 ÷ 40°C
- pH: 6 ÷ 14
- Servizio: Modelli monofase: S1 - pompa completamente immersa **(Fig. 1)**
  Modelli trifase: S1 - pompa completamente immersa **(Fig. 1)**
  S3 - corpo pompa completamente immerso o pieno **(Fig. 2A, 2B, 2C)** secondo il valore S3% riportato sulla targa, indicato nella **Tabella 1**
- Avviamenti orari: max 20 per motori con potenza P2 fino a 10 kW, max 15 per P2 oltre 10 kW

1.10 Condizioni speciali

L'elettropompa può lavorare in servizio continuo (S1) solo se completamente immersa.
Nell'installazione a secco, l'apparecchiatura deve lavorare con servizio intermittente periodico (S3).
Devono essere utilizzati almeno due sensori di livello (in ridondanza) per interrompere l'alimentazione quando il liquido scende al di sotto del livello minimo:
S1: pompa completamente immersa **(Fig. 1)**
S3 - corpo pompa completamente immerso o pieno **(Fig. 2A, 2B, 2C)**

ATTENZIONE! **Controllare sempre che la pompa lavori con il corretto livello minimo di liquido (v. paragrafo 3.3).**
È opportuno verificare sempre il corretto funzionamento dell'elettropompa nelle condizioni di minimo livello; a seconda della specifica installazione, potrebbe essere necessario adottare ulteriori accorgimenti per evitare la formazione di vortici con conseguente ingresso di aria in aspirazione dell'elettropompa.



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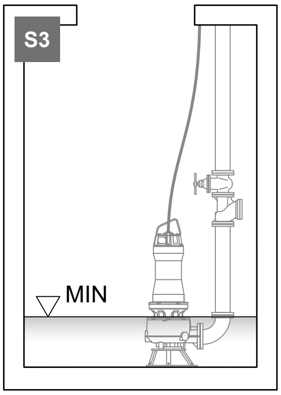
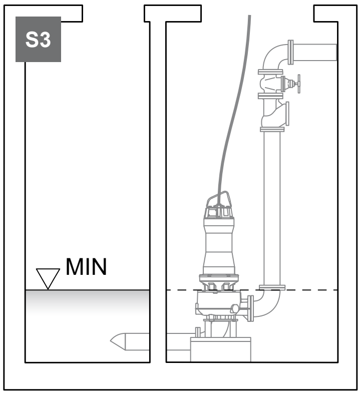
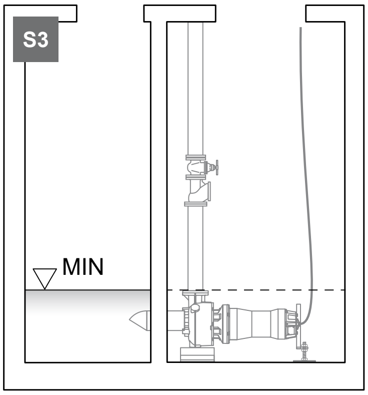


2A



2B



2C

Per interrompere l'alimentazione in caso di surrscaldamento del motore, l'apparecchiatura è equipaggiata, di serie, di una protezione termica all'interno dell'avvolgimento dello statore (v. paragrafo 4.4)

E' obbligatorio che l'utilizzatore colleghi le protezioni termiche ad un quadro di controllo munito di unità di sgancio e predisposto per evitare il riavvio automatico del'apparecchiatura.

Funzionamento tramite inverter: le protezioni termiche devono essere collegate correttamente al quadro elettrico in modo da interrompere l'alimentazione in caso di surriscaldamento del motore.

Le pompe Grey sono equipaggiate di sonda di umidità per rilevare la presenza di acqua all'interno della camera olio (vano tenute meccaniche).

La sonda di umidità deve essere collegata corettamente secondo le istruzioni riportate al paragrafo 4.5.

Viterie e ancoraggi devono essere in Classe A2-70, A2-A80, A4-70 o A4-80 secondo la norma EN ISO 3506-1

La pompa in versione -Ex può lavorare in servizio S3 secondo il valore S3% riportato sulla targa, come indicato nella seguente tabella:

Tabella 1: Servizio S3 per modelli versione -Ex

Tipo involucro	Descrizione _②③_⑦⑧_	P2 (kW)/ Poli	Servizio
G05M	_G 75/2_AT_	0.55/2	50%
	_G 100/2_AT_	0.75/2	50%
G05L	_G 150/2_AT_	1.1/2	30%
	_G 200/2_AT_	1.5/2	30%
	_G 250/2_AT_	1.8/2	20%
	_G 100/4_AT_	0.75/4	15%
	_G 150/4_AT_	1.1/4	15%
	_G 200/4_AT_	1.5/4	15%
G06S	_G 300/2_ET_	2.2/2	20%
	_G 200/4_ET_	1.5/4	20%
G06L	_G 400/2_ET_	3/2	20%
	_G 250/4_ET_	1.8/4	20%
	_G 300/4_ET_	2.2/4	20%
	_G 400/4_ET_	3/4	15%
G07S	_G 550/2_FT_	4/2	20%
	_G 750/2_FT_	5.5/2	15%
G07L	_G 1000/2_FT_	7.5/2	10%
	_G 550/4_FT_	4/4	15%
	_G 750/4_FT_	5.5/4	15%

Tipo involucro	Descrizione _②③_⑦⑧_	P2 (kW)/ Poli	Servizio
G08L	_G 1200/2_GT_	9/2	15%
	_G 1500/2_GT_	11/2	15%
	_G 1750/2_GT_	13/2	10%
	_G 1000/4_GT_	7.5/4	15%
G10S	_G 2000/2_HT_	15/2	10%
	_G 1200/4_HT_	9/4	15%
	_G 1500/4_HT_	11/4	10%
	_G 1000/6_HT_	7.5/6	10%
G10L	_G 2500/2_HT_	18.5/2	15%
	_G 2000/4_HT_	15/4	15%
	_G 1200/6_HT_	9/6	15%
	_G 1500/6_HT_	11/6	15%
	_G 1750/6_HT_	13/6	15%
M08S	_G 400/6_GT_	3/6	20%
M08L	_G 550/6_GT_	4/6	20%
	_G 750/6_GT_	5.5/6	20%

1.11 Copertura della garanzia

ZENIT garantisce il funzionamento dell'apparecchiatura secondo i parametri di progettazione a condizione che siano rispettati i requisiti operativi riportati sulla documentazione di prodotto. La garanzia sui singoli componenti è di 12 mesi dalla data di spedizione.
Zenit si impegna a riparare o sostituire il prodotto qualora i guasti siano dovuti a difetti di progettazione, lavorazione e assemblaggio e siano segnalati a Zenit entro il periodo di garanzia.
Non sono coperti da garanzia i guasti dovuti a:

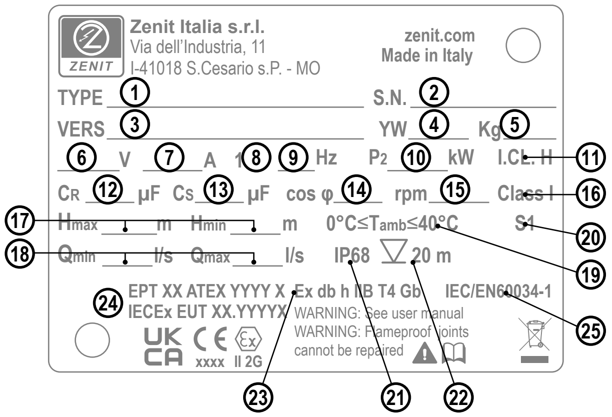
- normale usura;
- movimentazione, installazione ed utilizzo non conformi;
- impiego con sistemi di controllo non correttamente collegati;
- interventi svolti da personale non qualificato;
- impiego di ricambi non originali.

ATTENZIONE! **Qualsiasi modifica apportata al prodotto senza l'autorizzazione della casa costruttrice può generare situazioni di pericolo e causare un decadimento delle prestazioni e la perdita della garanzia.**

1.12 Targa (Fig. 3A, 3B)

Sul coperchio motore è applicata una targa metallica che indica i dati e le certificazioni relativi alla pompa.
Con questo manuale è stata fornita un’etichetta adesiva argentata che riporta le caratteristiche del prodotto che si trovano sulla targa metallica fissata alla pompa. Si consiglia di applicare questa etichetta nello spazio specifico all’interno del manuale e fare riferimento ai dati contenuti per eventuali richieste o informazioni.

Monofase


Zenit Italia s.r.l.
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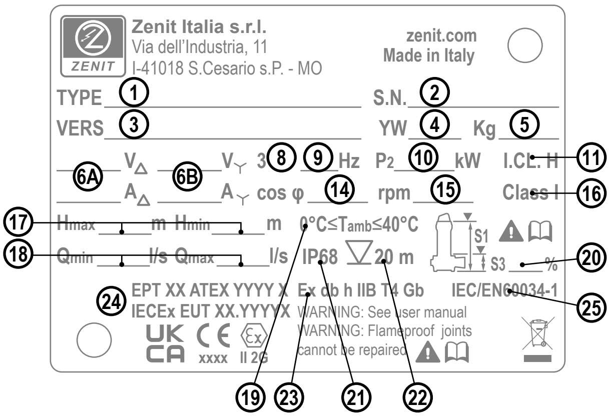
I-41018 S.Cesario s.P. - MO
ZENIT
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
⑥ V ⑦ A 1 ⑧ ⑨ Hz P2 ⑩ kW I.CL. H ⑪
CR ⑫ µF CS ⑬ µF cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1 ⑳
⑱ Qmin l/s Qmax l/s IP68 20 m ⑲
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
㉕
㉓ ㉑ ㉒

3A

Trifase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Via dell’Industria, 11
I-41018 S.Cesario s.P. - MO
ZENIT
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
6A V△ 6B VY 3 ⑧ ⑨ Hz P2 ⑩ kW I.CL. H ⑪
A△ AY cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1
⑱ Qmin l/s Qmax l/s IP68 20 m S3 % ⑳
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
㉕
⑲ ㉓ ㉑ ㉒

3B

1. Nome prodotto
2. Numero di serie
3. Versione
4. Anno e settimana di costruzione
5. Peso
6. Tensione nominale
6A. Tensione e corrente *(collegamento triangolo)*
6B. Tensione e corrente *(collegamento stella)*
7. Corrente nominale
8. Fasi
9. Frequenza
10. Potenza motore P2
11. Classe di isolamento motore
12. Condensatore di marcia
13. Condensatore di spunto
14. Fattore di potenza
15. Velocità *(giri/min)*
16. Classe di protezione IEC contro le scosse elettriche
17. Prevalenza minima e massima
18. Portata minima e massima
19. Temperatura ambiente
20. Servizio
21. Codice IP *(grado di protezione involucro)*
22. Profondità massima di immersione
23. Stringa di marcatura ATEX e/o IECEx *(solo modelli -Ex)*
24. Numero di certificato ATEX e IECEx *(solo modelli -Ex)*
25. Normative di riferimento motore

1.13 Significato della marcatura -Ex

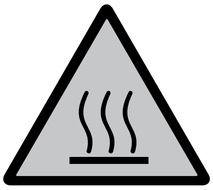
CE XXXX

Marcatura CE di conformità alla direttiva ATEX 2014/34/UE
XXXX indica il numero dell’organismo notificato (indicato sulla targhetta) che ha certificato il sistema di qualità per ATEX

-Ex marking string	
Ex II 2G *(ATEX only)*	Ex db h IIB T4 Gb

Simbolo	Significato
Ex	Marchio specifico di protezione dalle esplosioni secondo Alleg. II della Direttiva ATEX 2014/34/EU
II	Gruppo dell’apparecchiatura. Gruppo II: apparecchiatura elettrica per uso in atmosfere potenzialmente esplosive per la presenza di Gas, diversi dalle miniere.
2G	Categoria dell’apparecchiatura oggetto della certificazione per atmosfere potenzialmente esplosive per la presenza di Gas, Vapori, Nebbie (G). L’apparecchiatura può essere installata in ZONA 1
Ex db h IIB	Il modo di protezione elettrico utilizzato per l’apparecchiatura corrisponde alla protezione mediante custodia a prova di esplosione “db” – adatto per gas del Gruppo IIB e IIA . Il modo di protezione meccanica utilizzato per l’apparecchiatura è attraverso immersione in liquido “k” e sicurezza costruttiva “c” – adatto per gas del Gruppo IIB e IIA
T4	Classe di temperatura dell’apparecchiatura (temperatura superficiale massima 135°C)
Gb	Apparecchiatura con un “elevato” livello di protezione (EPL Gb), adatto per uso in ZONA 1

1.14 Etichette adesive applicate al prodotto



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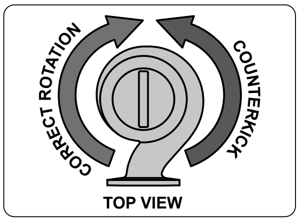

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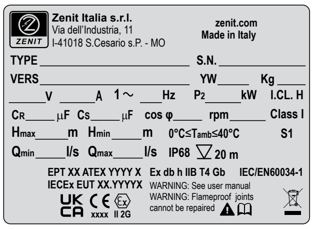

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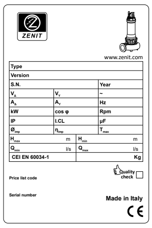
TYPE ______ S.N. ______
VERS ______ YW ______ Kg ______
______ V ______ A 1～ ______ Hz P_2 ______ kW I.CL. H
C_R ______ µF C_S ______ µF cos φ ______ rpm ______ Class I
H_{max} ______ m H_{min} ______ m $0°C \leq T_{amb} \leq 40°C$ S1
Q_{min} ______ l/s Q_{max} ______ l/s IP68 ▽ 20 m
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx Ex II 2G

6



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Type		
Version		
S.N.		Year
$V_Δ$	V_Y	~
$A_Δ$	A_Y	Hz
kW	cos φ	Rpm
IP	I.CL	µF
$Ø_{imp}$	$η_{imp}$	T_{max}
H_{max} m	H_{min} m	
Q_{min} l/s	Q_{max} l/s	
CEI EN 60034-1	Kg	

Quality check ☐

Price list code

Serial number

Made in Italy
CE

7

Fig. 4 - Etichetta di identificazione delle superfici a rischio di surriscaldamento
Fig. 5 - Etichetta di identificazione del corretto senso di rotazione della girante (vista dall'alto)
Fig. 6 - Etichetta argentata. Riproduce la targa dati applicata al prodotto e deve essere applicata nell'apposito spazio del presente manuale e ad essa occorre fare riferimento per qualsiasi informazione o richiesta.
Fig. 7 - Etichetta applicata all'imballo del prodotto

2. TRASPORTO E STOCCAGGIO

2.1 Controllo visivo

Verificare visivamente che l'imballo non abbia subito danni. Rimuovere i materiali da imballaggio e smaltirli in accordo alla normativa vigente. Prestare attenzione a non ferirsi con utensili taglienti e a non danneggiare il prodotto, in particolare i cavi elettrici.
Ispezionare il prodotto per accertarsi che non vi siano parti danneggiate o mancanti. Se dovessero presentarsi articoli mancanti rivolgersi a Zenit (o al suo distributore) o alla società di spedizione.
Verificare che i dati riportati sulla targa corrispondano a quelli del prodotto richiesto.

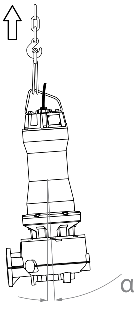
2.2 Movimentazione e sollevamento

Il sollevamento e la movimentazione della macchina devono avvenire mediante una catena o una cinghia fissata alla maniglia superiore, utilizzando un mezzo meccanico idoneo (gru, paranco, ecc.).
Prima di procedere al sollevamento, prendere nota del peso del prodotto riportato sulla targa ed utilizzare cinghie, catene e ganci adeguatamente dimensionati e certificati.
Accertarsi che l'elettropompa sia agganciata saldamente e che non possa cadere, rotolare o oscillare.
La maniglia superiore è stata progettata per garantire il bilanciamento dell'elettropompa durante il sollevamento, tuttavia potrebbero verificarsi delle oscillazioni della macchina al momento del distacco dal suolo **(Fig. 8)**.
Si raccomanda di non rimanere nei pressi dell'elettropompa durante la sua movimentazione.
Indossare sempre i dispositivi di protezione individuale.

ATTENZIONE! **Prima di sollevare la pompa, osservare la normativa locale relativa ai limiti di peso per gli oggetti movimentati manualmente, cioè senza l'utilizzo di apparecchiature di sollevamento.**

ATTENZIONE! **NON utilizzare MAI i cavi elettrici di alimentazione o di segnale per movimentare il prodotto.**

Assicurarsi che l'atmosfera nell'area di lavoro non sia potenzialmente esplosiva. La classificazione del sito di installazione deve essere definita dal proprietario.



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2.3 Stoccaggio

Durante il periodo di stoccaggio, l'elettropompa deve essere riposta nel suo imballo in un luogo idoneo, fuori dalla portata di bambini o persone non responsabili, adeguatamente assicurata contro cadute accidentali e protetta dall'umidità, dalle vibrazioni, dalla polvere e dalle temperature estreme (inferiore a -20°C/-4°F e superiore a +60°C/140°F).

ATTENZIONE! **Se l'elettropompa dovesse risultare congelata, non usare fiamme per liberarla dal ghiaccio ma immergerla, fino a scongelamento, nel liquido nel quale sarà installata.**

Prima di usare il prodotto, verificare le condizioni dell'olio delle tenute meccaniche qualora sia stato esposto a basse temperature.

ATTENZIONE! **Ruotare occasionalmente (almeno una volta ogni 2 mesi) la girante per evitare che le tenute meccaniche aderiscano fra loro.**

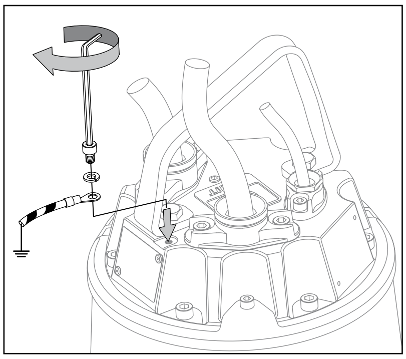
3. INSTALLAZIONE

3.1 Avvertenze generali di sicurezza

- Circoscrivere adeguatamente l'area di lavoro e indossare dispositivi di protezione individuale.
- Prima di qualsiasi operazione accertarsi che l'elettropompa ed il quadro elettrico siano isolati dalla rete e non possano essere messi inavvertitamente in tensione.
- Verificare l'integrità del cavo elettrico e delle guarnizioni e accertarsi che la girante ruoti liberamente.
- Le dimensioni della vasca nella quale l'elettropompa è installata devono essere tali da:
  - consentire ai regolatori di livello a galleggiante, se presenti, di muoversi liberamente;
  - evitare che il numero di cicli accensione/spegnimento dell'elettropompa sia superiore a quello consentito riportato sulla scheda tecnica.
- L'elettropompa deve essere calata nella vasca per mezzo di una cinghia o di una catena adeguatamente dimensionata ancorata alla maniglia.
- Prima dell'installazione, assicurarsi che il fondo della vasca sia piano.
- Per evitare problemi di cavitazione dovuti all'aspirazione dell'aria, accertarsi che l'ingresso dei liquidi nella vasca non avvenga in prossimità dell'elettropompa o sia diretto verso di essa.
- Accertarsi che l'elettropompa non lavori al di fuori della sua curva caratteristica.

Assicurarsi che l'atmosfera nell'area di lavoro non sia potenzialmente esplosiva.
Le persone non devono accedere all'area dell'installazione quando l'atmosfera è esplosiva.
La classificazione del sito di installazione deve essere approvata dalle autorità locali antincendio in ogni singolo caso.

La scarica di cariche elettrostatiche accumulate su componenti isolati può essere causa di esplosione.
Le elettropompe -Ex non presentano componenti isolati caricabili elettrostaticamente e sono tutte equipaggiate con una vite per il collegamento alla rete equipotenziale di terra (Fig. 9).
Eventuali componenti aggiuntivi installati nella zona di rischio devono essere collegati alla rete di terra secondo la norma EN 1127-1.
Verificare l'idoneità all'impiego in atmosfera potenzialmente esplosiva di ogni componente aggiuntivo installato nell'area di rischio.



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Prima dell'installazione, controllare il livello dell'olio nella camera delle tenute meccaniche.

3.2 Verifica del verso di rotazione della girante

Prima di procedere al collegamento elettrico definitivo, un tecnico qualificato deve verificare la correttezza del verso di rotazione della girante.
Sull'elettropompa è applicata un'etichetta adesiva che indica il verso di rotazione che deve avere la girante (freccia verde) e la direzione del contraccolpo (freccia rossa) quando l'elettropompa è vista dall'alto **(Fig. 5).**

Tutte le operazioni seguenti devono essere eseguite in luogo sicuro, in assenza di atmosfera potenzialmente esplosiva.

Operare nel modo seguente:
1. Posizionare l'elettropompa verticalmente, appoggiandola ai piedi di supporto o al basamento.
2. Assicurare l'elettropompa con una catena o cinghia di dimensioni adeguate agganciata alla maniglia superiore per evitare cadute accidentali che potrebbero verificarsi in seguito al contraccolpo.

ATTENZIONE! Il contraccolpo può essere molto forte. Non rimanere nei pressi dell'elettropompa durante la procedura.

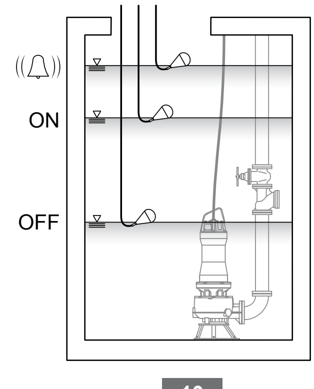
3. Collegare provvisoriamente il conduttore giallo-verde alla presa di terra dell'impianto e successivamente i cavi di alimentazione al teleruttore.
4. Allontanare le persone e gli oggetti dall'elettropompa ad una distanza di almeno 2 metri.
5. Azionare l'interruttore di marcia, alimentare l'elettropompa per alcuni secondi e quindi interrompere l'alimentazione azionando l'interruttore di arresto.
6. Verificare che il verso di rotazione sia corretto.

Se il verso di rotazione fosse contrario, invertire il collegamento al quadro di due delle tre fasi di alimentazione dell'elettropompa e riprovare ripetendo nuovamente la procedura descritta.
Stabilito il collegamento corrispondente al corretto verso di rotazione, CONTRASSEGNARE l'esatta sequenza di collegamento dei cavi al quadro, SCOLLEGARE i cavi di alimentazione dell'elettropompa e procedere con l'installazione definitiva.

ATTENZIONE! Se più elettropompe sono collegate ad un unico quadro elettrico, la verifica del verso di rotazione deve essere fatta singolarmente per ciascuna unità installata.

3.3 Installazione del sistema di controllo tramite galleggianti

I galleggianti consentono di controllare l'avviamento e l'arresto di una o più elettropompe in base ai livelli di liquido raggiunti nella vasca .
Inoltre, possono essere collegati a dispositivi di allarme per evitare che possano verificarsi condizioni anomale (tracimazione o funzionamento a secco).**(Fig.10)**
Essi devono essere installati lontano da vortici o cadute d'acqua.
In presenza di forti turbolenze, si consiglia di fissare i galleggianti ad un'asta rigida posizionata all'interno del pozzo.
Assicurarsi che non vi sia alcun oggetto che possa ostacolare il movimento dei galleggianti e che i cavi non si intralcino a vicenda, né possano attorcigliarsi o incastrarsi in sporgenze all'interno della vasca.
I galleggianti devono essere installati in modo tale che sia garantito il corretto livello minimo del liquido.



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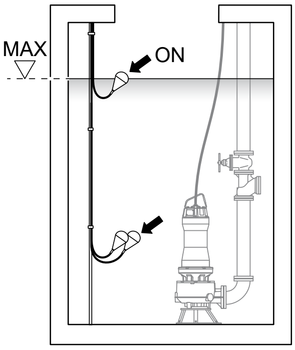
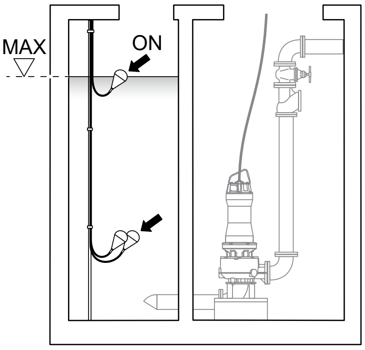
Il livello minimo del liquido deve essere controllato da due interruttori a galleggiante (in ridondanza) per arrestare l'alimentazione quando il liquido raggiunge il livello minimo (pompa completamente immersa).
Utilizzare solo interruttori a galleggiante idonei alla classificazione -Ex del sito di installazione.
Il collegamento al quadro elettrico di controllo deve essere eseguito interponendo un'interfaccia a Sicurezza Intrinseca tipo le Barriere Zener o le Barriere a Separazione Galvanica.

Assicurarsi che la commutazione **da arresto a marcia**
avvenga solo ed esclusivamente se i galleggianti si trovano nella posizione rappresentata in **Fig 11A, 11B, 11C.**
Assicurarsi che la commutazione **da marcia ad arresto**
avvenga solo ed esclusivamente se i galleggianti si trovano nella posizione rappresentata in **Fig 12A, 12B, 12C.**
Il collegamento elettrico dei galleggianti deve essere realizzato in modo tale da assicurare l'arresto della pompa in caso di malfunzionamento dei galleggianti.

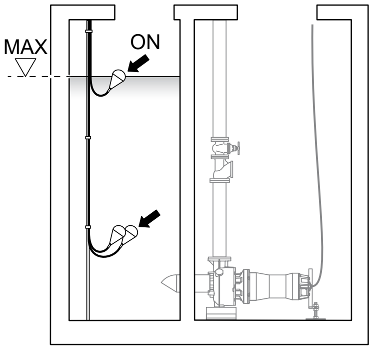
Assicurarsi che il volume di liquido effettivo della vasca non scenda al punto che il numero di avviamenti orari superi il massimo consentito



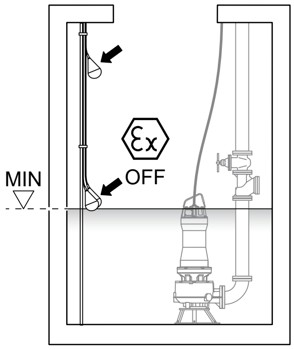
11 A



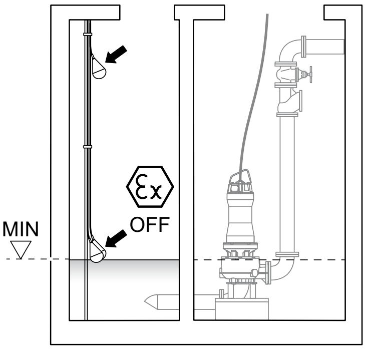
11 B



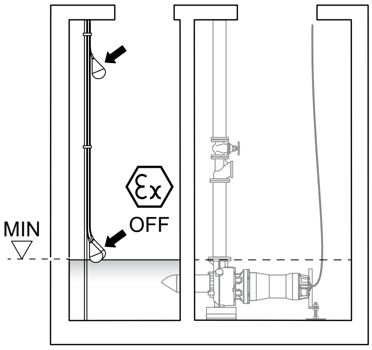
11 C



12 A



12 B



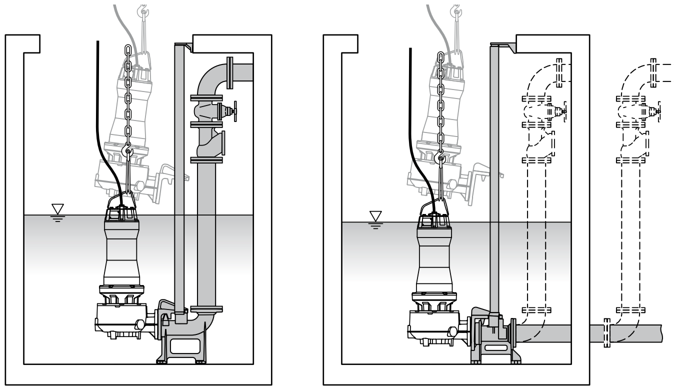
12 C

3.4 Tipi di installazione ammessi

Assicurarsi che l'atmosfera nell'area di lavoro non sia potenzialmente esplosiva.

3.4.1 Installazione con dispositivo di accoppiamento DAC

Questo tipo di installazione **(Fig. 13)** permette di estrarre l'elettropompa dalla vasca e di riposizionarla in modo rapido senza richiedere interventi sull'impianto.



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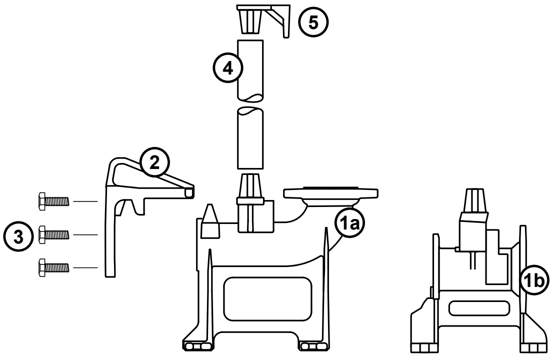
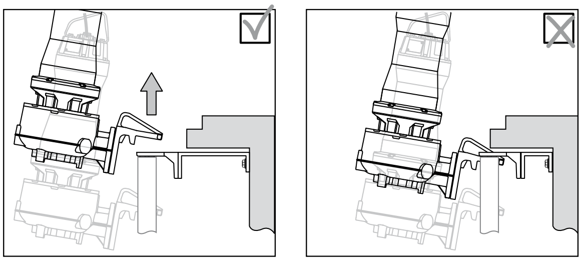


1a. Dispositivo di accoppiamento DAC V (mandata verticale)
1b. Dispositivo di accoppiamento DAC H (mandata orizzontale)
2. Flangia
3. Viti
4. Tubi-guida (non inclusi)
5. Staffa distanziale

Procedura di installazione (v. APPENDICE 1 pag. 130

1. Accertarsi che l'elettropompa sia scollegata dalla rete di alimentazione e che il verso di rotazione della girante sia corretto secondo la procedura descritta nel manuale.
2. Fissare la flangia alla bocca di mandata dell'elettropompa per mezzo delle viti in dotazione. Per i modelli con gancio, fissare il gancio al corpo pompa per mezzo delle viti in dotazione.
3. Disporre il dispositivo di accoppiamento sul fondo della vasca e segnare la posizione dei fori per il fissaggio.
4. Praticare i fori di diametro opportuno in base alle asole di fissaggio del dispositivo di accoppiamento e fissarlo stabilmente al fondo della vasca per mezzo di tasselli chimici o ad espansione. Utilizzare viteria in acciaio INOX o proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione.
5. Collegare la tubazione di mandata al dispositivo di accoppiamento. Si raccomanda di installare una saracinesca di intercettazione ed una valvola di ritegno a palla a passaggio libero integrale utilizzando un tubo di raccordo di lunghezza uguale ad almeno 5 volte il diametro della bocca di mandata.
6. Innestare i tubi-guida tagliati a misura sul dispositivo di accoppiamento. Possono essere utilizzati dei tubi in ferro zincato, o preferibilmente in acciaio INOX, di diametro adeguato (vedere la scheda tecnica).
7. Innestare la staffa-distanziale nell'estremità superiore dei tubi-guida e segnare la posizione dei fori per il suo fissaggio ad una delle pareti della vasca; accertarsi che i tubi guida siano perfettamente verticali utilizzando un filo a piombo o una livella a bolla

ATTENZIONE! Prima di fissare la staffa-distanziale accertarsi che, sollevando l'elettropompa, la flangia di accoppiamento possa essere completamente estratta dai tubi guida (Fig.14).



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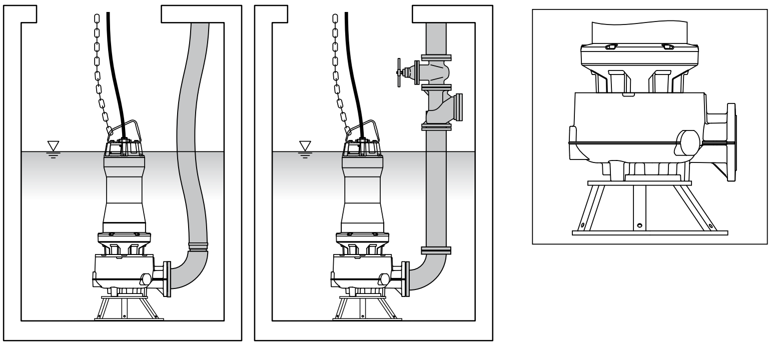
8. Praticare i fori di diametro opportuno in base alle asole di fissaggio della staffa distanziale e fissarla stabilmente per mezzo di tasselli chimici o ad espansione. Proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione.
9. Pulire la vasca da detriti e rifiuti residui.
10. Assicurare una catena o cinghia adeguatamente dimensionata alla maniglia e calare l'elettropompa nella vasca facendo scorrere la flangia lungo i tubi-guida fino all'unione con il dispositivo di accoppiamento.
11. Assicurare i cavi elettrici in modo che non siano soggetti a torsione e strappi e che non possano essere aspirati dall'elettropompa.
12. Fare uscire i cavi elettrici dalla vasca attraverso un condotto pulito e privo di asperità. Evitare che il cavo compia curve strette e possa essere schiacciato o danneggiato.
13. Collegare i cavi elettrici al quadro di comando.

3.4.2 Installazione mobile

Nell’installazione mobile **(Fig. 15)** l’elettropompa è fissata a uno specifico basamento che la mantiene in posizione verticale sul fondo della vasca e garantisce la corretta altezza della bocca di aspirazione.



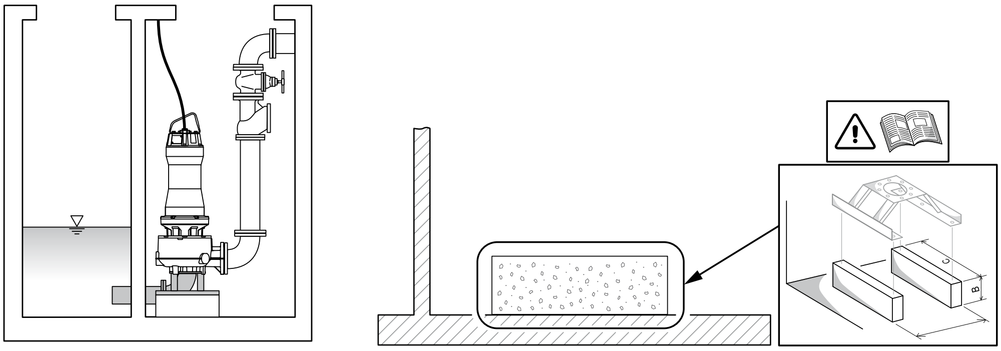
15

Procedura di installazione (v. APPENDICE 2 pag. 131)

1. Accertarsi che l’elettropompa sia scollegata dalla rete di alimentazione e che il verso di rotazione della girante sia corretto secondo la procedura descritta nel manuale.
2. Calare l’elettropompa sul basamento utilizzando una catena o cinghia adeguatamente dimensionata assicurata alla maniglia. Accertarsi che non possa cadere e/o oscillare.
3. Fissare l’elettropompa al basamento utilizzando le viti in dotazione.
4. Collegare la bocca di mandata alla tubazione tramite la flangia unificata. Utilizzare viteria in acciaio INOX o proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione. Si raccomanda di installare una saracinesca di intercettazione ed una valvola di ritegno a palla a passaggio libero integrale utilizzando un tubo di raccordo di lunghezza uguale ad almeno 5 volte il diametro della bocca di mandata.
5. Se la tubazione è di tipo flessibile, utilizzare un raccordo portagomma flangiato. Usare preferibilmente un tubo con rinforzo a spirale o di tipo semirigido per garantire che il passaggio libero rimanga costante anche in corrispondenza di curve o cambi di direzione. Assicurare il tubo al raccordo per mezzo di una fascetta metallica.
6. Calare l’elettropompa nella vasca fino a farla appoggiare stabilmente al fondo utilizzando una catena o cinghia adeguatamente dimensionata assicurata alla maniglia. Accertarsi che l’elettropompa non possa cadere e/o oscillare.
7. Assicurare i cavi elettrici in modo che non siano soggetti a torsione e strappi e che non possano essere aspirati dall’elettropompa.
8. Fare uscire i cavi elettrici dalla vasca attraverso un condotto pulito e privo di asperità. Evitare che il cavo compia curve strette e possa essere schiacciato o danneggiato.
9. Collegare i cavi elettrici al quadro di comando.

3.4.3 Installazione verticale in camera a secco

Per l’installazione verticale in camera a secco **(Fig. 16)**, l’elettropompa viene fornita, a richiesta, con la flangia di aspirazione predisposta per il fissaggio di un basamento curvo (KBC)



16

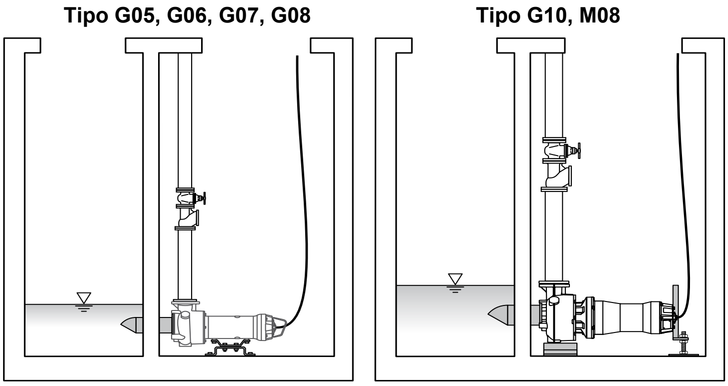
Procedura di installazione (v. APPENDICE 3 pag. 132)

1. Realizzare sul fondo della vasca due supporti in materiale idoneo a sostenere il peso e le sollecitazioni dell’elettropompa (cemento, calcestruzzo, muratura, ecc) al fine di ottenere la corretta altezza della bocca di aspirazione. Le dimensioni consigliate sono riportate sulla scheda tecnica;
2. Accertarsi che l’elettropompa sia scollegata dalla rete di alimentazione e che il verso di rotazione della girante sia corretto secondo la procedura descritta nel manuale;
3. Posizionare l’elettropompa sul basamento e bloccarlo con le viti di fissaggio;
4. Collegare la curva flangiata alla bocca di aspirazione dell’elettropompa con le viti di fissaggio. Se necessario, coricare l’elettropompa e assicurarla per impedire movimenti accidentali;
5. Assicurare una catena o cinghia adeguatamente dimensionata alla maniglia dell’elettropompa e calarla nella vasca posizionando il basamento sui supporti a fondo vasca;
6. Contrassegnare la posizione dei fori di fissaggio;
7. Praticare i fori di diametro opportuno in base alle asole di fissaggio del basamento.

8. Fissare stabilmente il basamento ai due supporti per mezzo di tasselli chimici o ad espansione. Utilizzare viteria in acciaio INOX o proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione;
9. Collegare il tubo di aspirazione alla curva flangiata;
10. Collegare il tubo di mandata all'elettropompa. Si raccomanda di installare una saracinesca di intercettazione ed una valvola di ritegno a palla a passaggio libero integrale utilizzando un tubo di raccordo di lunghezza uguale ad almeno 5 volte il diametro della bocca di mandata.
11. Pulire la vasca da detriti e rifiuti residui.
12. Assicurare i cavi elettrici in modo che non siano soggetti a torsione e strappi.
13. Fare uscire i cavi elettrici dalla vasca attraverso un condotto pulito e privo di asperità. Evitare che il cavo compia curve strette e possa essere schiacciato o danneggiato.
14. Collegare i cavi elettrici al quadro di comando.

3.4.4 Installazione orizzontale in camera a secco

Per l'installazione orizzontale **(Fig. 17)**, l'elettropompa presenta la predisposizione per il fissaggio alla struttura di sostegno in carpenteria metallica (KBS-H).



17

Procedura di installazione (tipo G05, G06, G07, G08) (v. APPENDICE 4 pag. 133)
1. Accertarsi che l'elettropompa sia scollegata dalla rete di alimentazione e che il verso di rotazione della girante sia corretto secondo la procedura descritta nel manuale.
2. Fissare la staffa inferiore al fondo della vasca. Utilizzare viteria in acciaio INOX o proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione.
3. Fissare la staffa superiore alla pompa.
4. Coricare la pompa posizionando la staffa superiore su quella inferiore.
5. Fissare saldamente le staffe fra loro con le viti.
6. Collegare le tubazioni di aspirazione e di mandata. Si raccomanda di installare una saracinesca di intercettazione ed una valvola di ritegno a palla a passaggio libero integrale utilizzando un tubo di raccordo di lunghezza uguale ad almeno 5 volte il diametro della bocca di mandata.
7. Pulire la vasca da detriti e rifiuti residui.
8. Assicurare i cavi elettrici in modo che non siano soggetti a torsione e strappi.
9. Fare uscire i cavi elettrici dalla vasca attraverso un condotto pulito e privo di asperità. Evitare che il cavo compia curve strette e possa essere schiacciato o danneggiato.
10. Collegare i cavi elettrici al quadro di comando.

Procedura di installazione (tipo G10, M08) (v. APPENDICE 4 pag. 133)
1. Accertarsi che l'elettropompa sia scollegata dalla rete di alimentazione e che il verso di rotazione della girante sia corretto secondo la procedura descritta nel manuale.
2. Posizionare l'elettropompa verticalmente su un piano regolare e stabile.
3. Svitare le viti di bloccaggio della maniglia di sollevamento, se presente, e rimuoverla. In alternativa, svitare e rimuovere i golfari.
4. Fissare la staffa superiore al coperchio motore dell'elettropompa. Prestare attenzione a non danneggiare i cavi elettrici.
5. Fissare il distanziale alla staffa superiore senza serrare i dadi di fissaggio.
6. Fissare la staffa inferiore al corpo pompa.
7. Utilizzando un filo a piombo, regolare la posizione del distanziale affinchè la sua piastra di appoggio sia complanare a quella della staffa inferiore; serrare i dadi del distanziale.
8. Mettere l'elettropompa in posizione con l'ausilio di un mezzo meccanico idoneo (gru, paranco). Per il sollevamento, utilizzare una catena o cinghia di dimensioni idonee al peso dell'elettropompa. Prestare attenzione alle oscillazioni dell'elettropompa che possono verificarsi in seguito al distacco dal suolo.
9. Fissare stabilmente il sistema al fondo della vasca utilizzando tasselli chimici o ad espansione. Utilizzare viteria in acciaio INOX o proteggere le viti e i dadi con un prodotto idoneo a prevenire la corrosione.
10. Collegare le tubazioni di aspirazione e di mandata. Si raccomanda di installare una saracinesca di intercettazione ed una valvola di ritegno a palla a passaggio libero integrale utilizzando un tubo di raccordo di lunghezza uguale ad almeno 5 volte il diametro della bocca di mandata.
11. Pulire la vasca da detriti e rifiuti residui.
12. Assicurare i cavi elettrici in modo che non siano soggetti a torsione e strappi.
13. Fare uscire i cavi elettrici dalla vasca attraverso un condotto pulito e privo di asperità. Evitare che il cavo compia curve strette e possa essere schiacciato o danneggiato.
14. Collegare i cavi elettrici al quadro di comando.

4. COLLEGAMENTI ELETTRICI

4.1 Avvertenze generali di sicurezza

Tutte le operazioni di collegamento alla rete elettrica devono essere eseguite da personale qualificato, nel rispetto delle normative vigenti: collegamenti elettrici eseguiti non correttamente possono generare incendi, rischio di folgorazione e danni al prodotto.

- Accertarsi che i conduttori non utilizzati siano opportunamente isolati e fissati all'interno del quadro elettrico.
- Prima dell'installazione assicurarsi che la tensione e la frequenza della linea di alimentazione siano quelle indicate sulla targa dati e che l'assorbimento sia inferiore alla corrente massima che l'impianto può erogare.
- La variazione massima ammessa sul valore della tensione nominale di targa è ± 5%
- Squilibrio di tensione tra le fasi ammesso: max 2%
- I fusibili e gli interruttori di protezione devono essere adeguatamente dimensionati alle caratteristiche dell'impianto.
- Per la protezione del motore dell'elettropompa utilizzare un salvamotore adeguato alle caratteristiche elettriche riportate sulla targa dati.
- Accertarsi che le protezioni termiche siano sempre collegate correttamente: il mancato collegamento della protezione termica, oltre a fare decadere la garanzia, può costituire pericolo.
- La funzionalità e la sicurezza elettrica delle elettropompe ZENIT sono garantite per la configurazione fornita dalla fabbrica: qualsiasi modifica (es: aggiunta di uno spezzone di cavo a quello originale) può determinare un decadimento delle caratteristiche dell'elettropompa.

Prima dell'installazione e della prima messa in servizio, assicurarsi che i cavi elettrici non siano in alcun modo danneggiati per evitare cortocircuiti.

4.2 Cavi

- Accertarsi che i cavi elettrici non siano in alcun modo danneggiati e che le estremità non siano state sottoposte ad umidità e/o immersione in acqua.
- I terminali liberi del cavo devono essere collegati ad un quadro elettrico omologato e con un grado di isolamento idoneo all'ambiente in cui è installato.
- Fissare i cavi elettrici in modo che non siano soggetti a torsione, strappo e/o schiacciamento.
- Se il cavo risultasse danneggiato non provvedere alla sua sostituzione ma rivolgersi a Zenit o ad un Centro Assistenza Autorizzato.
- Non sottovalutare i problemi correlati alla caduta di tensione.

I terminali liberi del cavo di alimentazione devono essere collegati ad un quadro elettrico certificato per l'ambiente potenzialmente esplosivo se è installato nell'area di rischio.

4.3 Messa a terra

- Accertare la presenza e l'efficienza dell'impianto di messa a terra e dell'interruttore differenziale.
- Accertarsi che il conduttore di terra sia circa 150 mm più lungo degli altri conduttori in modo che sia l'ultimo a sconnettersi dal quadro in caso di strappo accidentale.

La predisposizione per il collegamento del conduttore di terra esterno accetta cavi con una sezione trasversale di almeno 4 mm².

Non collegare il cavo di terra a tubazioni del gas, dell'acqua, parafulmini o cavi telefonici.
Un'impropria messa a terra può causare shock elettrico.

Sui modelli -Ex, assicurarsi che un conduttore di terra esterno (giallo/verde, con sezione trasversale di almeno 4 mm²) sia collegato al terminale di terra esterno sulla pompa utilizzando un fermacavo sicuro.
Pulire la superficie del collegamento di messa a terra esterna prima di montare il fermacavo.

4.4 Protezione termica

La pompa è dotata di protezioni termiche all'interno degli avvolgimenti dello statore per arrestare l'alimentazione in caso di surriscaldamento del motore.
La protezione termica standard è costituita da protettori termici bimetallici con temperatura di commutazione nominale NST = 150 ° C;
come opzione, i protettori bimetallici possono essere sostituiti da termistori PTC o sensori PT100.
I cavi della protezione termica sono contrassegnati da un'etichetta che riporta la scritta "TP" = THERMAL PROTECTION e devono essere collegati ai corrispondenti morsetti del quadro elettrico di controllo.

La connessione dei termoprotettori a un quadro elettrico è obbligatoria. Il quadro elettrico deve essere predisposto per garantire l'arresto del motore in caso di intervento della protezione termica interna e deve essere evitato il riavvio automatico dell'elettropompa che deve avvenire solo manualmente con l'intervento di un operatore dopo aver risolto le cause dell'anomalia.

4.5 Sonda di umidità

L'elettropompa può essere equipaggiata di sonda di umidità mono-elettrodo per il rilevamento e la segnalazione di infiltrazioni d'acqua nella camera olio delle tenute meccaniche (il conduttore di terra è utilizzato come percorso di ritorno per il rilevamento di soglia conduttivo).
In caso di segnalazione, mettere fuori servizio la pompa e procedere con un intervento di manutenzione.
Il cavo di segnale è contrassegnato da un'etichetta che riporta la lettera **S.**

Per installazioni con modelli certificati -Ex, il collegamento al quadro elettrico deve essere eseguito inserendo in zona sicura una barriera a sicurezza intrinseca con isolamento galvanico.

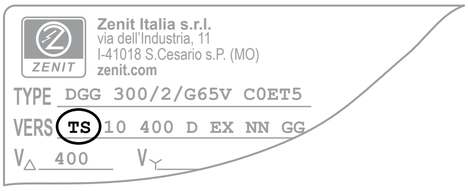
Dati elettrici relativi alla sicurezza per il sensore a sicurezza intrinseca:

Sonda	U_i: 30V; I_i: 120mA; P_i: 1.3W C_i: 0.3nF; L_i: ~ 0mH
Cavo	C_c: 200pF/m; L_c: 1µH/m; L_c/R_c= 30µH/Ω

4.6 Collegamento elettrico

Per effettuare il collegamento elettrico della elettropompa operare nel modo seguente:

1. Verificare sulla targa dati il tipo di connessione elettrica richiesta (campo VERS) **(fig. 18)**.
2. Collegare il conduttore di terra al relativo morsetto nel quadro elettrico, secondo lo schema di collegamento.
3. Collegare i cavi di alimentazione ai relativi morsetti nel quadro elettrico, secondo gli schemi di collegamento.
4. Collegare i conduttori dei dispositivi di controllo ai relativi terminali sul quadro elettrico.


ZENIT
Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⅄

18

N.B. Osservare attentamente le connessioni indicate negli schemi di collegamento.
Fare riferimento alla documentazione specifica fornita con la pompa per i collegamenti elettrici di sensori e dispositivi di protezione non standard

SCHEMI DI COLLEGAMENTO A PAGINA 123

5. MESSA IN SERVIZIO

ATTENZIONE! Prima di eseguire qualsiasi operazione, accertarsi che l'elettropompa e il quadro elettrico siano disconnessi dall'impianto elettrico e non possano avviarsi accidentalmente.

Prima di avviare la pompa, verificare che:

- sia presente olio nella camera delle tenute meccaniche (v. paragrafo 6.5.3)
- la girante possa ruotare liberamente
- l'apparecchiatura sia installata correttamente e stabilmente
- i dispositivi di monitoraggio installati siano collegati correttamente

5.1 Avvertenze generali di sicurezza

- Ogni operazione deve essere eseguita da personale tecnico competente.
- L'elettropompa deve essere sempre utilizzata con i dispositivi di sicurezza installati ed efficienti.
- Mantenere oggetti e persone ad una distanza di sicurezza dalle macchine installate e impedire il contatto di persone e animali con il liquido nel quale sono immerse.
- Accertarsi che la rotazione della girante sia corretta seguendo la procedura descritta nel manuale.

5.2 Avviamento

Le pompe non devono essere avviate se l'atmosfera nella vasca è potenzialmente esplosiva.

Ultimata l'installazione è opportuno effettuare un collaudo dell'impianto per accertare la sua perfetta funzionalità.
La pompa deve essere sempre utilizzata con i dispositivi di sicurezza installati ed efficienti; assicurarsi che tutti i dispositivi di protezione siano stati collegati correttamente.
La pompa non deve funzionare a secco; controllare che il livello del liquido sia al di sopra del motore.
Controllare che le valvole a saracinesca, se installate, siano aperte.
Accendere l'alimentazione e lasciare la pompa in funzione qualche istante in modo da:

- verificare che la corrente assorbita sia entro il limite indicato sulla targa;
- controllare che i sistemi di monitoraggio funzionino correttamente (nessun allarme o avviso);
- controllare che l'impostazione dei livelli di accensione e spegnimento (livelli minimi e massimi) sia corretta.

ATTENZIONE! Il numero massimo di avviamenti orari consentiti deve essere rispettato per evitare danni al motore.

ATTENZIONE! In caso di rumori anomali o vibrazioni della pompa, guasti, allarmi o avvertenze, arrestare immediatamente la pompa e non riavviarla fino a quando non viene rilevata e risolta la causa delle anomalie.

5.3 Livello di pressione acustica

Il livello di pressione acustica dell'elettropompa in funzione è inferiore a 70 dB.
Tuttavia, in alcuni impianti e in alcuni punti di lavoro sulla curva delle prestazioni questa soglia può essere superata.
Verificare il livello di pressione acustica ammesso nell'ambiente in cui è installato il prodotto per evitare la violazione di leggi locali.

6. MANUTENZIONE E ASSISTENZA

6.1 Premessa

Una mantenzione regolare e un'ispezione periodica sono indispensabili per il mantenimento delle prestazioni della pompa. Per questo motivo, il sistema deve essere pulito, revisionato e ispezionato con cadenza regolare.
Qualora la pompa dovesse comportarsi diversamente dalle normali condizioni operative, fare riferimento al capitolo "7. Guida alla risoluzione di problemi" di questo manuale e intervenire tempestivamente per risolvere l'anomalia.

ATTENZIONE! Le istruzioni relative a controllo e manutenzione di queste pompe non devono essere intese come interventi di tipo "fai-da-te" ma richiedono una conoscenza tecnica specifica.

NOTA: Il controllo e la sostituzione dei componenti richiede attrezzatura specifica.
Per eseguire queste operazioni, contattare il rivenditore presso cui è stato acquistato il prodotto o l'ufficio vendite ZENIT della propria zona.

Controllo e riparazione di apparecchiature -Ex devono essere eseguiti conformemente a:

- **EN 60079-17: Atmosfere esplosive - Parte 17: Ispezione e manutenzione di installazioni elettriche**
- **IEC 60034-23: Macchine elettriche rotanti – Parte 23: Riparazione, revisione e ripristino**
- **EN 60079-19: Atmosfere esplosive - Parte 19: Riparazione, revisione e ripristino dell'apparecchiatura**

Qualsiasi intervento su elettropompe in versione -Ex deve essere eseguito da personale tecnico qualificato presso un Centro Assistenza Certificato -Ex (in base a norme internazionali e/o locali) o da un Centro Assistenza Zenit, utilizzando solo ricambi originali.
Non rispettare questo comportamento determina la perdita della certificazione -Ex.

6.2 Avvertenze generali di sicurezza

- Prima di eseguire qualsiasi operazione sulla pompa installata in liquidi nocivi per la salute, procedere con una pulizia approfondita della pompa, del serbatoio, ecc. in accordo con le disposizioni locali
- Prima delle operazioni di pulizia e/o manutenzione un tecnico competente deve isolare la pompa interrompendo l'alimentazione e accertarsi che non possa avviarsi accidentalmente.
- Scollegare sempre prima i conduttori delle fasi, poi il conduttore di terra giallo-verde.
- Accertarsi che la pompa non possa cadere o rotolare causando danni a cose o persone.
- Lavare abbondantemente con acqua pulita e/o detergenti specifici la superficie della pompa prima di qualsiasi intervento su di essa.
- In seguito ad un uso prolungato, la superficie della pompa può diventare molto calda: lasciarla raffreddare adeguatamente per evitare ustioni.
- Osservare sempre le norme di sicurezza in vigore nel luogo dell'installazione, eventuali norme locali e le regole del comune buon senso.

6.3 Manutenzione programmata e assistenza

La frequenza degli interventi di manutenzione dipende dal tipo di installazione, dal carico di lavoro a cui la pompa è sottoposta e dalla natura del liquido nel quale è immersa.

Durante le operazioni di manutenzione programmata o in qualsiasi caso in cui le prestazioni della pompa dovessero diminuire o le vibrazioni e la rumorosità dovessero essere maggiori di quelle originarie, è necessario procedere ad un controllo delle parti soggette ad usura; allo scopo, rivolgersi ad un Centro di Assistenza Autorizzato.

Intervallo	**Tipo di verifica**	
	Modello standard	**Modello -Ex**
Settimanale	Verificare che la corrente assorbita sia entro il valore nominale.	
	Verificare che la tensione di alimentazione sia entro ± 5% del valore nominale.	
Mensile	Controllo della pompa: Se le prestazioni della pompa diminuiscono significativamente, la girante può essere ostruita o bloccata da detriti. Rimuovere i detriti e sostituitre le parti eventualmente danneggiate. Controllo dei cavi: vedere paragrafo 6.5.1 "controllo cavi elettrici". Misura della resistenza di isolamento: il valore di riferimento della resistenza di isolamento = min. 20 MΩ. *NOTA: Il motore deve essere sottoposto a controllo se il valore della resistenza di isolamento è sensibilmente più basso da quello rilevato durante la precedente verifica.*	
Ogni 6 mesi oppure dopo 3000 ore, a seconda di quale sia raggiunto prima	Controllo e pulizia di catena o fune di sollevamento: - Sostituire in caso di danni, corrosione o usura - Rimuovere eventuali corpi estranei	
	Controllare argani, ganci e catene se presentano segni di usura, danni o corrosione. Pulirli e lubrificarli se necessario e sostituire i componenti danneggiati. Rimuovere eventuali corpi estranei presenti.	
	Verificare che viti, dadi e bulloni siano serrati correttamente. Stringere le viti, se necessario, e sostituire eventualmente il frenafiletti.	
	Controllare gli ancoraggi sul fondo della vasca ad ogni svuotamento.	
		Controllare cavi, olio, tenute meccaniche, cuscinetti, parti soggette a usura (girante, flangia di aspirazione,…). Se l'olio contiene acqua, controllare le tenute meccaniche. Vedi paragrafo 6.5.3 "Procedura di controllo e sostituzione dell'olio". *NOTA: sostituire sempre i componenti in gomma (o-ring, guarnizioni) se la pompa deve essere smontata durante il controllo*
Annuale	Controllare cavi, olio, tenute meccaniche, cuscinetti, parti soggette a usura (girante, flangia di aspirazione,…). Se l'olio contiene acqua, controllare le tenute meccaniche. Vedi paragrafo 6.5.3 "Procedura di controllo e sostituzione dell'olio". *NOTA: sostituire sempre i componenti in gomma (o-ring, guarnizioni) se la pompa deve essere smontata durante il controllo*	
Ogni 2 anni oppure dopo 9000 ore, a seconda di quale sia raggiunto prima	Cambio olio. *NOTA: Vedere il paragrafo "Controllo dell'olio e procedura di cambio" per maggiori dettagli.*	
	Sostituzione delle tenute meccaniche. *NOTA: Il controllo e la sostituzione delle tenute meccaniche richiede un'attrezzatura specifica. Per compiere queste operazioni contattare il distributore presso cui l'apparecchiatura è stata acquistata, o un rivenditore della propria zona.*	
		Sostituzione cuscinetti.
Una volta ogni 2 – 5 anni	Revisione: La pompa deve essere revisionata anche se funziona regolarmente. In particolare, potrebbe essere necessaria una revisione anticipate se la pompa è utilizzata in modo continuo.	

6.4 Pulizia

Rimuovere i residui dalla superficie della pompa e lavarla con acqua corrente. Se la parte idraulica risulta ostruita, pulirla accuratamente. Prestare particolare attenzione alla parte idraulica e rimuovere completamente ogni residuo.
Se la pompa è utilizzata per applicazioni saltuarie, è necessario, dopo ogni utilizzo, provvedere al lavaggio della parte idraulica per evitare la formazione di incrostazioni facendo compiere alla macchina alcuni cicli di pompaggio di acqua pulita.
Si raccomanda di evitare la formazione di sedimenti anche sui galleggianti per garantire il rispetto delle soglie di start e stop.

6.5 Controlli

Verificare che la pompa non abbia riportato danni e che viti, dadi e bulloni siano serrati correttamente. Stringere le viti alla corretta coppia di serraggio (v. paragrafo 6.6), sostituendo eventualmente il frenafiletti, se necessario.

6.5.1 Controllo cavi elettrici

Cavi e conduttori sono particolarmente soggetti a danneggiamento. Devono essere ispezionati ad intervalli regolari ogni qualvolta sia possibile.
Controllare che il cavo elettrico sia intatto e non presenti schiacciamento, tagli o altri segni di usura.
Un cavo danneggiato può permettere l’ingresso di liquido nella pompa e causare dispersione elettrica, corto circuito, shock elettrico o incendio.
Controllare che il pressacavo sia intatto.
I componenti danneggiati o difettosi devono essere sostituiti immediatamente.

6.5.2 Controllo cuscinetti

Tutti i cuscinetti sono ad elementi volventi di tipo autolubrificato a vita.
Ruotare l’albero manualmente per verificare che il movimento sia fluido e non presenti rumorosità anomala. In caso contrario provvedere alla sostituzione dei cuscinetti.

Cuscinetti difettosi possono ridurre la sicurezza -Ex

6.5.3 Procedura di controllo e sostituzione dell’olio

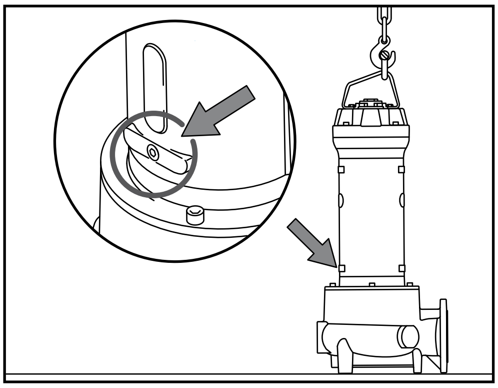
La sostituzione dell’olio e l’ispezione delle tenute meccaniche sono necessari qualora la sonda di umidità rilevi un ingresso di acqua all’interno della camera olio.
La camera olio è progettata in modo tale che, riempita con la pompa in posizione verticale, la corretta quantità di olio sia ottenuta quando il livello raggiunge il foro per il riempimento (tappo olio).

Usare olio tipo TOTAL Bio Hydraulic TMP FR46 o equivalente con grado di viscosità ISO (viscosità cinematica a 40°C) 40-90 cSt, punto di infiammabilità ≥ 240°C.
Qualora l’olio indicato non sia reperibile, contattare Zenit.

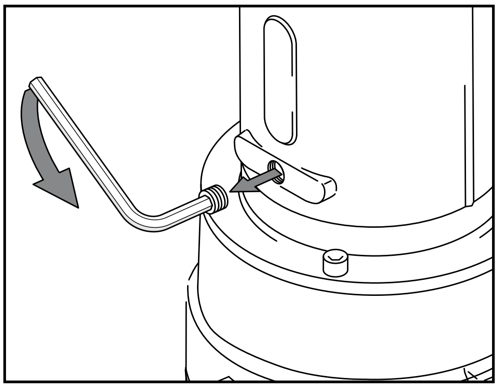
All’interno della camera olio potrebbe essersi formata una sovrapressione dovuta all’eventuale perdita della tenuta meccanica. Svitare il tappo lentamente coprendolo con uno straccio di dimensioni adeguate.

Non disperdere l’olio usato nell’ambiente ma consegnarlo ad un centro di raccolta specializzato.

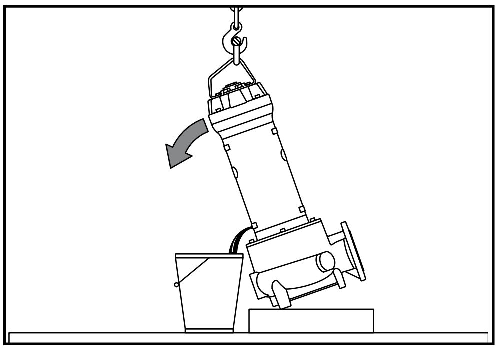
Procedura di cambio olio
Tipo involucro G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L



1. Posizionare l’elettropompa su un piano regolare e stabile. Utilizzare un sistema di sollevamento idoneo e adeguatamente dimensionato.Assicurarla per impedire che possa rotolare o oscillare.
2. Individuare i tappi della camera olio dell’elettropompa.

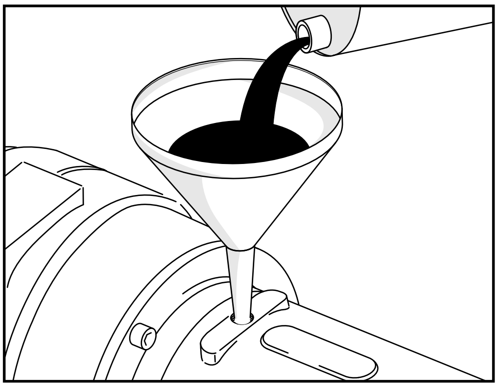


3. Svitare il tappo della camera olio



4. Lasciare scaricare l’olio in un recipiente di dimensioni idonee e possibilmente trasparente.
5. Posizionare il recipiente contenente l’olio su un piano orizzontale e lasciarlo fermo alcuni minuti per permettere all’acqua eventualmente contenuta di depositarsi sul fondo:

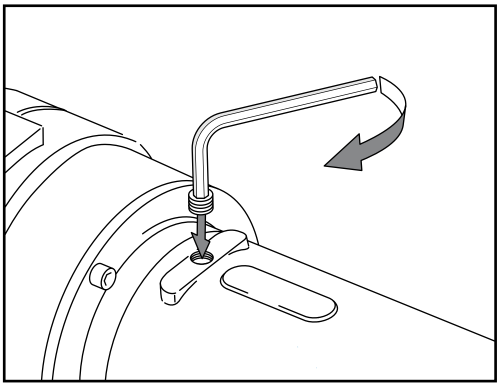
- Olio pulito e privo di acqua: la tenuta meccanica è in buone condizioni e si può immettere olio nuovo.
- Olio con minima presenza di acqua: può essere dovuto all’assestamento della tenuta meccanica nelle prime ore di funzionamento pertanto il fenomeno è trascurabile.
- Olio con acqua e impurità: controllare la tenuta meccanica che deve essere sostituita con una nuova. La sostituzione deve essere effettuata da un Centro Assistenza autorizzato.



6. Collocare la pompa orizzontalmente sul banco

7. Riempire la camera delle tenute meccaniche con olio lubrificante biodegradabile

Tipo involucro	Quantità d’olio camera tenute meccaniche (ml)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

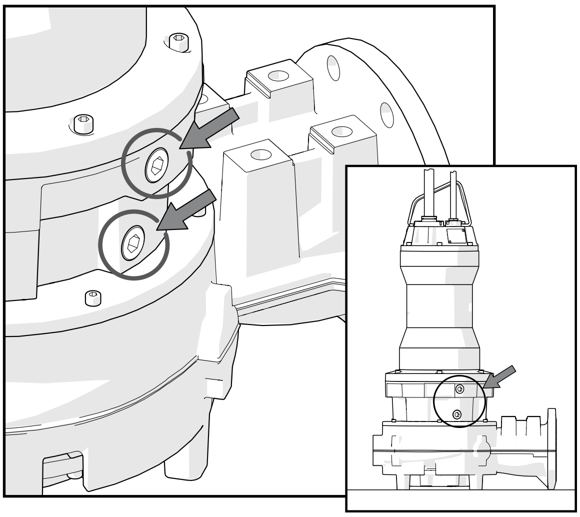


8. Avvitare il tappo della camera olio.

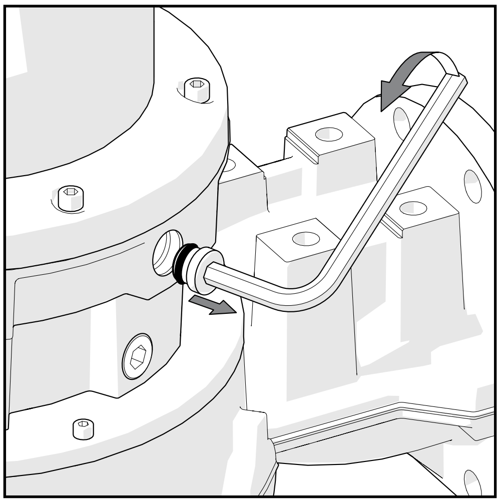
ATTENZIONE! **Usare frenafiletti tipo Loctite 243.**

Tipo involucro	Tappo olio
G05M - G05L **G06S - G06L** **G07S - G07L** **G08L**	1/8” NPT
G10S - G10L	3/8” DIN 906

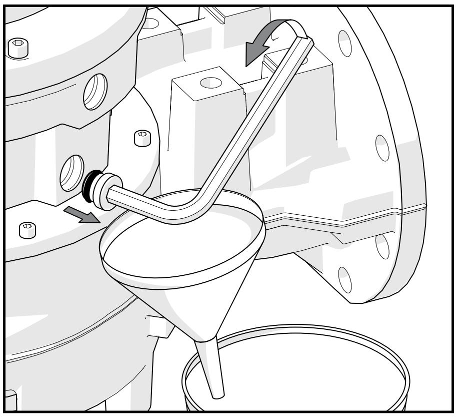
Procedura di cambio olio
Tipo involucro M08S - M08L



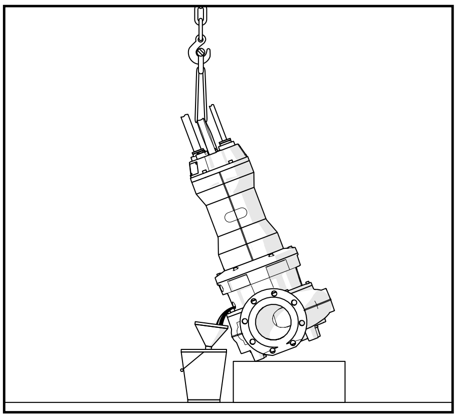
1. Posizionare l’elettropompa su un piano regolare e stabile. Utilizzare un sistema di sollevamento idoneo e adeguatamente dimensionato.Assicurarla per impedire che possa rotolare o oscillare.
2. Individuare i tappi della camera olio dell’elettropompa.



3. Svitare il tappo superiore della camera olio.



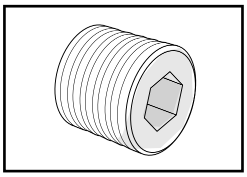
4. Svitare il tappo inferiore della camera olio.



5. Lasciare scaricare l'olio in un recipiente di dimensioni idonee e possibilmente trasparente.
NOTA: per verificare se la capacità del recipiente utilizzato è sufficiente, vedere in Tabella la quantità d'olio contenuta nella camera.

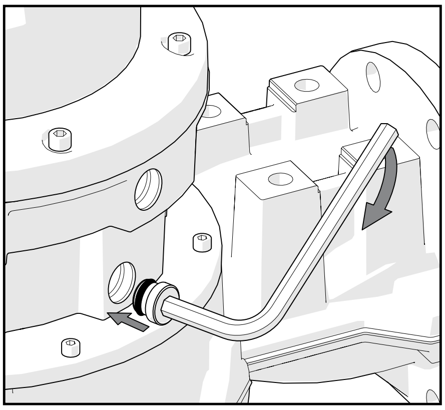
6. Posizionare il recipiente contenente l'olio su un piano orizzontale e lasciarlo fermo alcuni minuti per permettere all'acqua eventualmente contenuta di depositarsi sul fondo:

- Olio pulito e privo di acqua: la tenuta meccanica è in buone condizioni e si può immettere olio nuovo.
- Olio con minima presenza di acqua: può essere dovuto all'assestamento della tenuta meccanica nelle prime ore di funzionamento pertanto il fenomeno è trascurabile.
- Olio con acqua e impurità: controllare la tenuta meccanica che deve essere sostituita con una nuova. La sostituzione deve essere effettuata da un Centro Assistenza autorizzato.

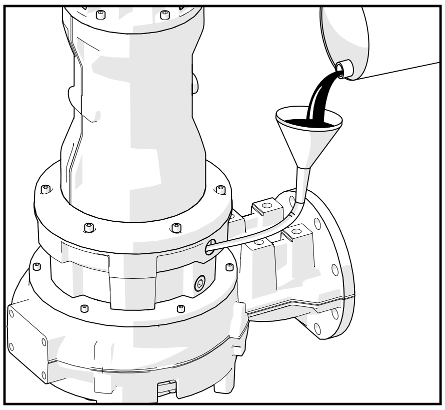


Tipo involucro	Tappo camera olio
M08S - M08L	2x 3/8" DIN 906

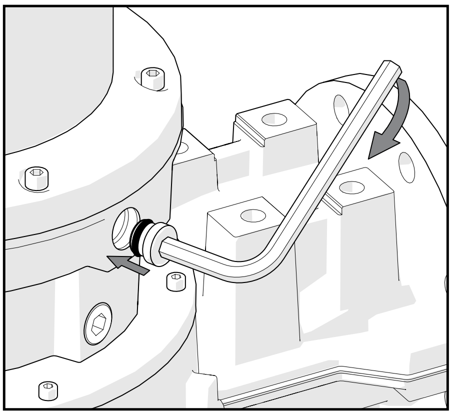
ATTENZIONE! **Usare frenafiletti tipo Loctite 243.**



7. Avvitare il tappo inferiore della camera olio.



8. Riempire la camera delle tenute meccaniche con olio lubrificante biodegradabile



9. Avvitare il tappo superiore della camera olio.

Tipo involucro	Quantità d'olio camera tenute meccaniche (ml)
M08S - M08L	2300

6.6 Viteria

In caso di sostituzione, usare viteria Classe A2 70, A2 80, A4 70 o A4 80 secondo la norma ISO 3506-1.

Coppie di serraggio (Nm)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. SMALTIMENTO

Smaltire correttamente il prodotto dividendo i vari componenti e destinandoli ai centri di raccolta differenziata.
Utilizzare un servizio pubblico o privato di smaltimento rifiuti secondo la normativa locale in vigore.

Il simbolo del cassonetto barrato riportato sull’apparecchiatura o sulla sua confezione indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente e non smaltito assieme agli altri rifiuti urbani MISTI.

L’adeguata raccolta differenziata per l’avvio successivo dell’apparecchiatura dismessa al riciclaggio, al trattamento e allo smaltimento ambientalmente compatibile contribuisce ad evitare possibili effetti negativi sull’ambiente e sulla salute e favorisce il reimpiego e/o riciclo dei materiali di cui è composta l’apparecchiatura.
Lo smaltimento abusivo del prodotto da parte dell’utilizzatore comporta l’applicazione delle sanzioni amministrative previste dalla normativa vigente.

8. GUIDA ALLA RISOLUZIONE DI PROBLEMI

	Problema	Possibile causa	Soluzione
1	La pompa non si avvia oppure si avvia ma si arresta immediatamente	Alimentazione inadeguata o insufficiente (es. interrruzione di corrente, caduta di tensione, ecc.)	Contattare un tecnico esperto
		Cavo scollegato o danneggiato	Controllare l’intergità del cavo e che la connessione alla rete sia corretta
		Guasto del quadro elettrico	Contattare un tecnico esperto per individuare la causa del guasto
		Fusibili bruciati	Controllare il tipo di fusibili e sostituirli con altri di valore adeguato
		Intervento della protezione magnetotermica	v. Punto 2
		Intervento della protezione termica	v. Punto 3
		Allarme sonda di umidità	v. Punto 4
		Intervento dell’interruttore differenziale (RCD)	v. Punto 5
		Condensatore danneggiato o collegato erroneamente (motore ~1)	Contattare un tecnico esperto per la sostituzione del condensatore e controllare che sia correttamente collegato
		Intervento del sensore di livello	Verificare il corretto collegamento e funzionamento del sensore di livello
2	Intervento dell’interruttore magnetotermico	Tensione di alimentazione troppo bassa o fasi non bilanciate.	Contattare un tecnico esperto
		Errato collegamento elettrico	Contattare un tecnico esperto per controllare e correggere il collegamento elettrico
		Relè di sovracorrente tarato ad un valore troppo basso o danneggiato	Controllare il relè di sovracorrente. Tarare il relé secondo il valore di corrente indicato in targa
		Avvolgimento in cortocircuito	Rivolgersi ad un centro di assistenza autorizzato
		Idraulica bloccata da corpi estranei	Provvedere alla pulizia dell’idraulica e alla rimozione del blocco
		Rotore bloccato	Rivolgersi ad un centro di assistenza autorizzato
3	La protezione termica interviene dopo un breve tempo di funzionamento	La pompa è immersa in un liquido troppo caldo	Ridurre la temperatura del liquido
		Idraulica bloccata da corpi estranei	Provvedere alla pulizia dell’idraulica e alla rimozione del blocco
		Parti interne danneggiate	Rivolgersi ad un centro di assistenza autorizzato
		Tensione non corretta	Verificare che la tensione di alimentazione corrisponda a quella indicata in targa
		Cuscinetti difettosi o usurati	Rivolgersi ad un centro di assistenza autorizzato
		Eccessivo numero di avviamenti orari	v. Punto 6
4	Intervento dell’interruttore differenziale (RCD)	Umidità nel motore	Rivolgersi ad un centro di assistenza autorizzato
		Basso isolamento del motore	Rivolgersi ad un centro di assistenza autorizzato
		Cavo danneggiato	Verificare l’integrità del cavo di alimentazione e rivolgersi ad un centro di assistenza per l’eventuale sostituzione

5	La pompa funziona ma la portata è ridotta o nulla	Idraulica bloccata da corpi estranei	Provvedere alla pulizia dell'idraulica e alla rimozione del blocco
		Tubo di mandata ostruito da corpi estranei	Provvedere alla pulizia del tubo di mandata
		Valvola di ritegno bloccata	Provvedere alla pulizia delle valvole di ritegno
		Saracinesca parzialmente chiusa o bloccata	Aprire ed eventualmente pulire la saracinesca
		La girante ruota in senso contrario	Controllare il verso di rotazione e invertire i collegamenti elettrici di due delle tre fasi
		Perdite nell'impianto	Controllare l'impianto ed eliminare la causa delle perdite
		Errata selezione pompa	Sostituire la pompa con una adeguata
6	Eccessivo numero di avviamenti orari	Errato settaggio dei sensori di livello	Correggere il settaggio dei sensori di livello
		Malfunzionamento dei sensori di livello	Verificare la corretta funzionalità dei sensori
		Turbolenze in prossimità dei sensori di livello	Rimuovere le cause di turbolenza o modificare il posizionamento dei sensori di livello
		Pozzetto troppo piccolo	Modificare le dimensioni del pozzetto
7	Presenza di vibrazioni o rumore eccessivo	Parti interne danneggiate	Rivolgersi ad un centro di assistenza autorizzato
		Cuscinetti difettosi o usurati	Rivolgersi ad un centro di assistenza autorizzato
		Girante ostruita, squilibrata o danneggiata	Rivolgersi ad un centro di assistenza autorizzato
		Girante bloccata	Provvedere alla pulizia della girante e alla rimozione del blocco
		La girante ruota in senso contrario	Controllare il verso della rotazione e invertire i collegamenti elettrici di due delle tre fasi
		Fase mancante	Contattare un tecnico esperto
		Oscillazioni dell'impianto	Controllare l'impianto
8	La pompa funziona ma l'assorbimento è eccessivo	Errato punto di lavoro	Assicurare che la pompa lavori all'interno del suo campo di funzionamento
		Tensione di alimentazione non corretta	Riportare la tensione di alimentazione al valore indicato in targa
		Idraulica bloccata da corpi estranei	Provvedere alla pulizia dell'idraulica e alla rimozione del blocco
		Cuscinetti difettosi o usurati	Rivolgersi ad un centro di assistenza autorizzato
		La girante ruota in senso contrario	Controllare il verso della rotazione e invertire i collegamenti elettrici di due delle tre fasi
		Avvolgimento statore guasto	Rivolgersi ad un centro di assistenza autorizzato
9	Rilevamento infiltrazioni	Infiltrazione d'acqua nel motore, a causa di cavi, o-ring o pressacavo danneggiati	Rivolgersi ad un centro di assistenza autorizzato
		Infiltrazione d'acqua nella camera olio a causa di usura o guasto delle tenutemeccaniche o degli o-ring	

Per riparazioni o altre richieste è necessario fornire le seguenti informazioni sul prodotto

Modello	**Numero di serie**	**Data di acquisto**

Note:

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EN

For correct installation and safe use of the product, read this manual carefully and keep it safe in a clean, easily accessible place for future reference.
Misuse of the product may cause even serious injury and damage, cause malfunctions and lead to loss of warranty cover.

1. GENERAL INFORMATION

1.1 Manufacturer's details

ZENIT Italia s.r.l. - via dell'Industria, 11 - 41018 S.Cesario sul Panaro (MO) – Italy

1.2 Key to the symbols used in the manual

⚠	Warning - Hazard for operators and pump
⚡	Warning - Electrical risk
♨	Warning - Very hot surfaces with burn hazard
Ex	Warning - These instruction must be observed for Explosion-proof pumps (-Ex models). Failure to comply with this instruction may cause danger of an explosion occurring. It is recommended to follow these instruction also for standard pump.
CAUTION	Important information to be read with special care

⚠ 1.3 General safety regulations

- Equipment is not suitable for unskilled and/or incompetent persons; keep out of reach of children;
- Installation operations must be carried out by skilled technical staff capable of understanding the contents of the manual; the staff assigned to install and maintain the product must be trained in the inevitable residual risks related to electrical equipment;
- Make sure that persons cannot accidentally fall into the tank, e.g. by installing a cover or railing;
- During handling, installation or disinstallation operations the equipment must be disconnected from the power supply panel;
- Pay attention to the risks presented by gas and vapors in the work area;
- Do not swallow or inhale any component of the equipment;
- People and animals must not enter or come into contact with the liquid until the equipment has been removed from the tank;
- Do not allow the free end of the electric cable to come into contact with liquids of any kind;
- The electric system must have a ground connection in good working order;
- Before connecting the electricity supply, ensure that the equipment has been installed correctly and retire to a safe distance;
- Do not use the equipment for purposes other than those for which it was designed and constructed, since the manufacturer does not accept liability for injury or damage caused by the equipment if used in contravention of the instructions in the manual, or in the event of non-compliance with the maintenance and safety recommendations; for aggressive chemical environment, contact the manufacturer before use to check whether the materials are compatible with the environment concerned;
- Do not modify the equipment or any of its parts (connections, holes, finishes, etc.) for any reason;
- The user must comply with the relevant safety regulations in the country of use, as well as common-sense safety precautions, and ensure that regular cleaning and maintenance operations are carried out correctly;
- The installer is responsible for ensuring that the ambient conditions of use are suitable, to ensure health and safety;
- The customer is responsible for the staff authorised to use the equipment;
- Failure to comply with this requirement may put users at risk and lead to loss of warranty rights.

1.4 Training of installation and maintenance staff

The staff assigned to install and maintain the product must be trained in the inevitable residual risks related to electrical equipment operating in contact with biological liquids.
They must also be capable of reading and understanding the contents of the technical documentation supplied with the product, especially the electrical wiring diagrams.

1.5 Personal protective equipment (PPE) to be used

Wear regulation personal protective equipment when handling the pump.
Safety gloves, safety footwear, protective goggles enclosed at the sides and leather aprons must be worn.
Before handling the product once installed, wash it with plenty of running water and/or detergents.

1.6 Residual risks

The product is designed and manufactured to ensure safe, reliable use.
However, since it is intended for use with liquids that constitute a health hazard, the installation and maintenance staff must take great care and always wear regulation personal protection equipment.
During all work on the product, users must take care not to drop the pump and must not underestimate the risks of burns, electrocution, drowning and suffocation or poisoning due to the inhalation of toxic gases.

⚡ ⚠ Ex **To reduce the risks associated with lightning, the user is required to install any necessary and adequate lightning protection measures.**
Flameproof joints cannot be repaired
Do not open in presence of Explosive Atmospheres

During handling, installation or disinstallation operations the pump must be disconnected from the power supply panel.

1.7 Product description - Intended use

These products are intended for use in residential, industrial and municipal sewage treatment plants and lifting stations.
They are designed to lift and pump slurries, faecal material, clean water, waste water or water soiled with solid or fibrous materials.

They may not be used with liquids for human consumption or in potentially explosive atmospheres (except for models with explosion-proof certification).

Grey submersible pumps must under no circumstances be used to pump explosive, flammabile or comustible liquids.

Explosion proof models are certified for use in potentially explosive atmosphere according to the marking string recorded on the plate (See Points 1.12)

This electric pump is a fixed appliance intended to be used while fastened to a support or while secured in a specific location. This appliance is not intended to be held in the hand during normal use.
Grey subersible pump motor are always provided by ZENIT with a proper flexible cord for power supply, control and monitor circuits. Water-resistant cable entry provides both sealing and strain relief functions to ensure a safe installation. No additional elements are required to complete the equipment. Main and control panels are on customer care and shall be in conformance with the equipment data.

Grey submersible pumps are classified depending on the hydraulic type.

- DGG Grey series: electric pumps with set-back Vortex impeller which allows ample free passages.
  Applications: biological liquids and wastewater civil and industrial lifting, wastewater treatment plants and livestock farms;
- DRG Grey series: electric pumps with Open Channel impeller.
  Applications: recirculation of industrial and process waters, civil lifting, drainage and lifting of water from first rainfall tanks;
- GRG Grey series: electric pumps with multi-channel open impeller with a grinding system.
  Applications: lifting of liquids containing fibres and filaments, professional and industrial applications, livestock farms;
- APG Grey series: electric pumps with high-head immersed multi-channel open impeller.
  Applications: lifting of clean liquids or liquids with small solids or sand, slightly sandy seepage waters.

1.7. 1 Code designation

The pump can be identified by the “type” and the “version” designations stated on the pump dataplate. See point 1.12.

Code example:

Type

DGG 300/2/G65V C0ET5

(A) (B) (C)

① ② ③ ④ ⑤⑥⑦⑧⑨

① Type of impeller
  DG = Vortex
  DR = Channels
  GR = Grinder
  AP = High head
② Series
  G = Grey

③ Power (HPx100) / motor poles
④ Pump outlet
  (A) TYPE (GAS thread/Flanged)
  (B) DIAMETER (mm)
  (C) POSITION
    V = vertical, H = horizontal

⑤ Hydraulic variant
⑥ Hydraulic version
⑦ Motor size
⑧ Motor phases
  M = Single-phase, T = Three-phase
⑨ Frequency
  5 = 50Hz, 6 = 60Hz

Version

TS 10 400 D EX NN GG

⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Electrical variant
⑪ Cable lenght
⑫ Rated voltage

⑬ Starting
  D = DOL
  Y = star/delta
⑭ Certification
  NN = standard
  EX = ATEX, ATEX + IECEx
  CX = IECEX only

⑮ Customization
⑯ Impeller material

1.8 Technical data

The product’s technical data and characteristics are provided in the technical data sheet.
The following tables show the type of motor housing in relation to the electric motor sizes

SINGLE PHASE version

Type	Description _ ②③_⑦⑧_	P2 (kW)/ poli
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

THREE PHASE version

Type	Description _ ②③_⑦⑧_	P2 (kW)/ Poles
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

THREE PHASE version

Type	Description _ ②③_⑦⑧_	P2 (kW)/ Poles
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

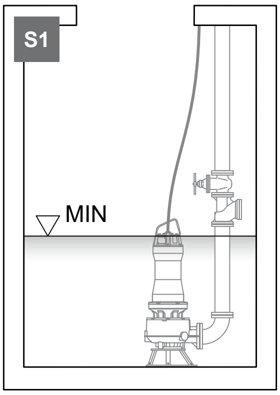
1.9 Operating conditions

For correct use, comply with the following operating conditions:
- Liquid/Ambient temperature: 0 ÷ 40°C
- pH value: 6 ÷ 14
- Duty service: Single-phase models: S1 - fully sumberged pump **(Fig. 1)**
  Three-phases models: S1 - fully sumberged pump **(Fig. 1)**
  S3 - fully submerged pump body or filled pump body **(Fig. 2A, 2B, 2C)** according to S3% value marked on the dataplate, as for **chart 1**.
- Starts per hour mode: maximum 20 for motor with rated power P2 up to 10 kW, 15 for P2 over 10 kW

1.10 Special conditions

The electropump can operate in continuous duty service (S1) only when it is completely submerged. In dry applications, the equipment must only be powered in intermittent periodic service (S3).
At least two level sensors (in redundancy) must be used to shutdown the power supply when the liquid to be pumped is below the minimum level:
S1: fully sumberged pump **(Fig. 1)**
S3: fully submerged pump body or filled pump body **(Fig. 2A, 2B, 2C)**

CAUTION **Check always that the electric pump operates correctly with the minimum liquid level (see point 3.3).**
A check should always be performed to ensure that the electric pump operates correctly with the minimum liquid level. Depending on the specific installation, additional measures may be necessary to avoid that turbulence can cause inflow of air in the suction.



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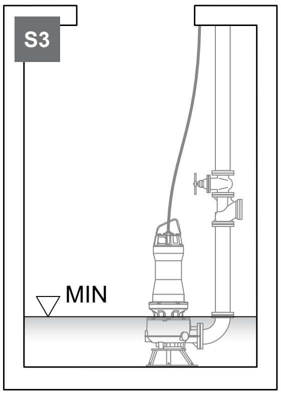
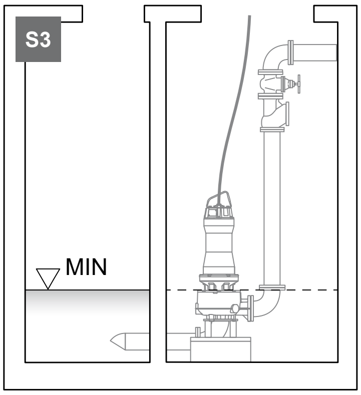
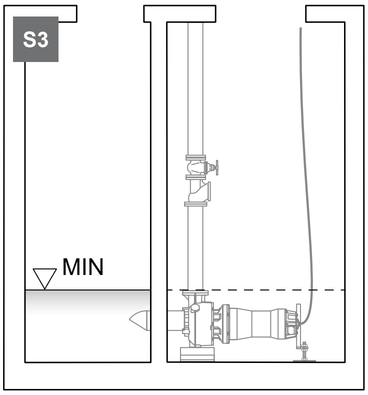


2A



2B



2C

To shut down the power supply in case of motor overheating, the equipment is provided, as standard, with thermal protectors into the stator windings **(see point 4.4)**.

It is mandatory that the user connect thermal protectors with a tripping unit in the control panel set in a way to avoid the automatic restart of the equipment.

Supply through inverter: thermal protectors must be properly connected to control panel in order to shut down the power supply in the event of overheating.

Grey pumps are equipped with a leakage probe to detect the entrance of water in the oil chamber (mechanical seals compartment).

The leakage probe must be electrically connected in accordance with instructions of point 4.5.

Bolts and fasteners used must be Class A2-70, A2-A80, A4-70 or A4-80 according to EN ISO 3506-1

The -Ex version pump can be used in duty type S3 according to S3% value marked on the dataplate as for the following chart

CHART 1: Duty type S3 for -Ex version pump

Type	Description _②③_⑦⑧_	P2 (kW)/ Poles	Duty service
G05M	_G 75/2_AT_	0.55/2	50%
	_G 100/2_AT_	0.75/2	50%
G05L	_G 150/2_AT_	1.1/2	30%
	_G 200/2_AT_	1.5/2	30%
	_G 250/2_AT_	1.8/2	20%
	_G 100/4_AT_	0.75/4	15%
	_G 150/4_AT_	1.1/4	15%
	_G 200/4_AT_	1.5/4	15%
G06S	_G 300/2_ET_	2.2/2	20%
	_G 200/4_ET_	1.5/4	20%
G06L	_G 400/2_ET_	3/2	20%
	_G 250/4_ET_	1.8/4	20%
	_G 300/4_ET_	2.2/4	20%
	_G 400/4_ET_	3/4	15%
G07S	_G 550/2_FT_	4/2	20%
	_G 750/2_FT_	5.5/2	15%
G07L	_G 1000/2_FT_	7.5/2	10%
	_G 550/4_FT_	4/4	15%
	_G 750/4_FT_	5.5/4	15%

Type	Description _②③_⑦⑧_	P2 (kW)/ Poles	Duty service
G08L	_G 1200/2_GT_	9/2	15%
	_G 1500/2_GT_	11/2	15%
	_G 1750/2_GT_	13/2	10%
	_G 1000/4_GT_	7.5/4	15%
G10S	_G 2000/2_HT_	15/2	10%
	_G 1200/4_HT_	9/4	15%
	_G 1500/4_HT_	11/4	10%
	_G 1000/6_HT_	7.5/6	10%
G10L	_G 2500/2_HT_	18.5/2	15%
	_G 2000/4_HT_	15/4	15%
	_G 1200/6_HT_	9/6	15%
	_G 1500/6_HT_	11/6	15%
	_G 1750/6_HT_	13/6	15%
M08S	_G 400/6_GT_	3/6	20%
M08L	_G 550/6_GT_	4/6	20%
	_G 750/6_GT_	5.5/6	20%

1.11 Manufacturer’s Warranty

ZENIT warrants that pump will function according to design parameters whether the customer will observe the requirements of operating documentation in force. The warranty on individual parts is 12 months from the date of shipment.
ZENIT undertakes to repair or replace the product if failures are due to design, manufacturing and assembly defects and are reported to Zenit during the warranty period.
The warranty does not cover failures due to:

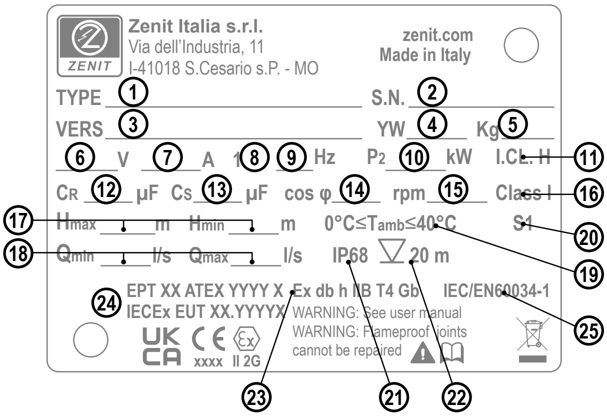
- normal wear and tear;
- improper handling, installation and use;
- use with incorrectly connected control systems;
- work done by unskilled staff;
- use of non-genuine spare parts.

CAUTION **Any modifications made to the product without the manufacturer’s authorisation may cause hazards and lead to a deterioration in performance and loss of warranty cover.**

1.12 Dataplate (Fig. 3A, 3B)

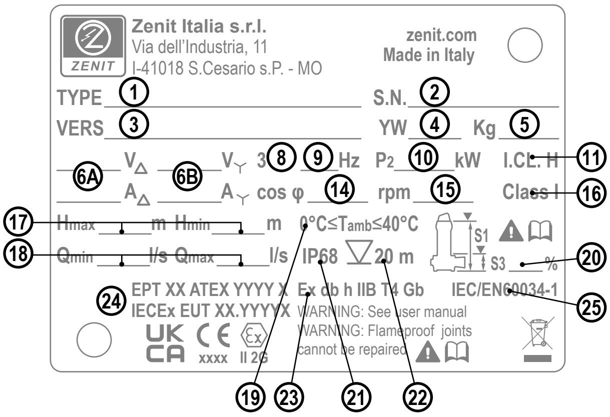
On the motor cover you find a metal plate which states the operating data and approvals applying to the pumps.
With this manual, a sticky label containing the product data found on the metallic plate affixed to the electric pump has been provided.
We recommend that you put this label in the specific place provided within the manual and then refer to the data contained on the label for any requirements or information.

Single phase


Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
⑥ V ⑦ A 1 ⑧ ⑨ Hz P2 ⑩ kW I.Cl. H ⑪
CR ⑫ µF Cs ⑬ µF cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1 ⑳
⑱ Qmin l/s Qmax l/s IP68 20 m ⑲
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1 ㉕
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA
CE xxxx II 2G
㉓ ㉑ ㉒

3A

Three phase


Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
V△ VY 3 ⑧ ⑨ Hz P2 ⑩ kW I.Cl. H ⑪
⑥A A△ ⑥B AY cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1
⑱ Qmin l/s Qmax l/s IP68 20 m S3 % ⑳
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1 ㉕
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA
CE xxxx II 2G
⑲ ㉓ ㉑ ㉒

3B

1. Product name
2. Serial number
3. Product version
4. Year and week of production
5. Weight
6. Rated voltage
6A. Voltage and current *(delta connection)*
6B. Voltage and current *(Y connection)*
7. Rated current
8. Motor phases
9. Frequency
10. Motor output power P2
11. Motor insulation class
12. Run capacitor
13. Start capacitor
14. Power factor
15. Speed *(revolutions per minute)*
16. IEC protection class against electric shock
17. Minimum and maximum head
18. Minimum and maximum flow-rate
19. Ambient temperature
20. Duty type
21. IP code *(degree of protection provided by enclosure)*
22. Maximum immersion depth
23. ATEX and/or IECEx marking string *(-Ex models only)*
24. ATEX and IECEx certification number *(-Ex models only)*
25. Motor reference standards

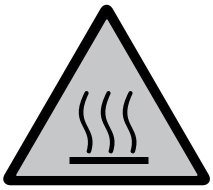
1.13 -Ex marking string (potentially explosive atmospheres)

CE XXXX	CE marking of conformity according to the ATEX directive 2014/34/EU XXXX stand for the number of the notified body (marked on the plate) which has certified the quality system for ATEX

-Ex marking string	
Ex II 2G *(ATEX only)*	Ex db h IIB T4 Gb

Symbol	Meaning
Ex	The specific marking of explosion protection given in the Annex II of the Directive 2014/34/EU
II	Group of the equipment. Group II: electrical equipment for use in places with an explosive gas atmosphere other than mines
2G	Category of the equipment subject of certification, in presence of potentially explosive atmospheres of Gas, Vapors and Mist (G). The equipment can be installed in ZONE 1.
Ex db h IIB	The type of electrical protection for the equipment is a flameproof enclosure “db”, suitable for gas Group IIB and IIA. The type of mechanical protection for the equipment is through liquid immersion “k” and constructional safety “c”, suitable for gas Group IIB and IIA.
T4	Temperature Class of the equipment (maximum surface temperature 135°C)
Gb	Equipment with “high” level of protection (EPL Gb), suitable for use in ZONE 1.

1.14 Decals applied to the product



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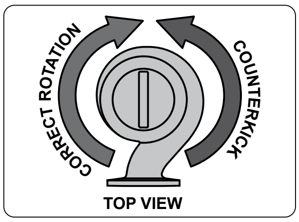

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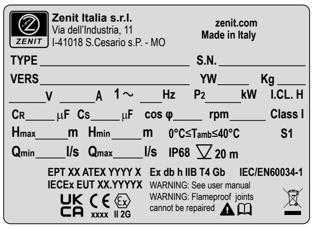

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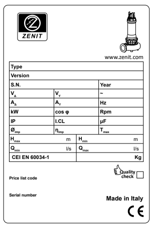
Made in Italy

TYPE ____________ S.N. ____________
VERS ____________ YW_____ Kg _____
_____V _____A 1～ ___Hz P_2_____kW I.CL. H
C_R_____µF C_S_____µF cos φ_____ rpm______ Class I
H_{max}_____m H_{min}_____m 0°C≤T_{amb}≤40°C S1
Q_{min}_____l/s Q_{max}_____l/s IP68 ▽ 20 m
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx Ex II 2G

6



www.zenit.com

Type		
Version		
S.N.		Year
V_Δ	V_Y	~
A_Δ	A_Y	Hz
kW	cos φ	Rpm
IP	I.CL	µF
$Ø_{imp}$	$η_{imp}$	T_{max}
H_{max} m	H_{min} m	
Q_{min} l/s	Q_{max} l/s	
CEI EN 60034-1	Kg	

Price list code
Quality check ☐
Serial number
Made in Italy
CE

7

Fig. 4 - Decal identifying surfaces with high temperature risk
Fig. 5 - Decal indicating correct impeller rotation direction viewed from above (three-phase models only)
Fig. 6 - Silver sticker. Reproduces the dataplate affixed to the product. It must be stuck into the space provided in this manual and be referred to when making any requests or enquiries.
Fig. 7 - Sticker applied to the production packaging

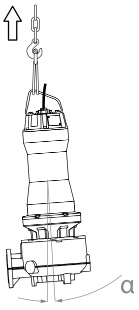
2. TRANSPORT AND STORAGE

2.1 Visual inspection

Make a visual inspection of the packaging for damage. Remove the packaging materials and dispose of them as required by law. Take special care not to injure yourself with sharp tools and not to damage to the product, especially the electrical wiring.
Inspect the product to ensure that there are no damaged or missing parts. If articles are missing, contact Zenit (or its dealer) or the forwarders.
Check that the data on the dataplate are the same as those of the product required.

2.2 Handling and lifting

The pump must be lifted and handled using a chain or sling secured to the handle on top, with suitable machinery (crane, hoist, etc.).
Before lifting, make a note of the weight of the product stated on the dataplate and use certified slings, chains and hooks of suitable load capacity.
Ensure that the electric pump is firmly secured and cannot fall, rotate or swing.
The handle on top is designed to ensure that the pump will be balanced during lifting; however, it may swing when lifted off the ground **(Fig. 8)**. Do not stand close to the pump during handling. Always wear personal protection equipment.



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CAUTION **Before attempting to lift the pump, observe any local regulations that set limits for the weight to be lifted manually by individuals, i.e. handled without the use of lifting equipment.**

CAUTION **NEVER handle the product by means of the power supply or signalling wiring.**

Make sure that the atmosphere in the working area is not potentially explosive.
The classification of the installation site must be defined by the owner.

2.3 Storage

During storage, the electric pump must be kept in its packaging, in a suitable place, out of the reach of children or unauthorised people, adequately secured against accidental falls and protected against humidity, vibrations, dust and extreme temperatures (below -20°C/-4°F and above +60°C/140°F).
Before handling, make sure that the ambient temperature and the product temperature are stabilised at a temperature higher than -20°C.

CAUTION **If the pump should freeze, do not use flames to remove the ice; immerse it in the liquid in which it is to be installed until it thaws out.**

The condition of the mechanical seal oil should be checked before using the product if it has been exposed to low temperatures.

CAUTION **Turn the impeller occasionally (at least every 2 months), to prevent the mechanical seals from sticking together.**

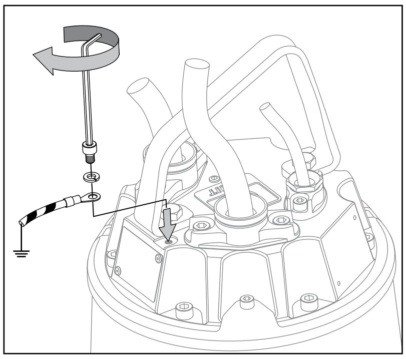
3. INSTALLATION

3.1 General safety precautions

- Fence off the working area by appropriate means and wear personal protection equipment.
- Before carrying out any operation, make sure that the pump and electrical panel are disconnected from the electrical mains and cannot be accidentally powered up.
- Check the electric cable and gaskets for damage and make sure that the impeller turns freely.
- The size of the tank in which the pump is installed must be such that:
  - any level float switches are able to move freely;
  - the number of pump switch on/switch off cycles does not exceed the permitted number stated in the technical information;
- The pump must be lowered into the tank using a sling or chain of suitable size tied to the handle.
- Prior to installation, make sure the tank bottom is even.
- To prevent the cavitation problems caused if the pump draws in air, ensure that the liquids do not flow into the tank near to or towards the pump.
- Make sure that the pump does not operate off its characteristic curve.

Make sure that the atmosphere in the working area is not potentially explosive. Persons must not enter the installation area when the atmosphere is explosive. The classification of the installation site must be approved by the local fire-fighting autorities in each individual case.

The shock from built up electrostatic charges on isolated components could cause an explosion. -Ex pumps do not have isolated components that are electrostatically chargeable and they are all equipped with screw for connection to the equipotential ground network (Fig. 9). Any additional components installed in the hazardous area must be connected to the earthing network according to the EN 1127-1 rule.
Check the suitability for use in potentially explosive atmospheres of each additional component installed in the hazardous area.



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Prior to installation, check the oil level in the mechanical seals oil chamber.

3.2 Checking the impeller rotation direction

Before making the definitive electrical connection, a skilled technician must make sure the impeller rotation direction is correct.
The pump carries a decal which indicates the correct impeller rotation direction (green arrow) and the relative kickback direction (red arrow) when the pump is viewed from above **(Fig. 5).**

All of the following operations should be carried out in a secure place, in absence of potentially explosive atmospheres;

Proceed as follows:

1. Place the pump vertical on its feet or base.
2. Secure the pump by tying a suitably sized chain or sling to the handle on the top to prevent it from falling over after the kickback.

CAUTION The kickback may be very strong. Do not stand close to the pump during the procedure.

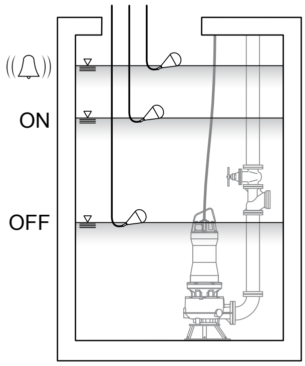
3. Temporarily connect the yellow-green wire to the system ground connector and then connect the power supply wires to the contactor.
4. Make sure there are no people or objects within a distance of at least 2 metres of the pump.
5. Operate the start switch, power up the pump for a few seconds and then shut off the power by flicking the stop switch.
6. Check that the rotation direction is correct.

If the pump is rotating in the wrong direction, invert two of the pump’s three power supply phases and try again, repeating the procedure described. Once the connection which provides the correct rotation direction has been obtained, MARK the precise order in which the wires have been connected to the system, DISCONNECT the power supply wires from the pump and proceed with definitive installation.

CAUTION If more than one pump is connected to a single control panel, the rotation direction must be checked individually for each unit installed.

3.3 Installing the float switch control system

Float switches allow one or more pumps to be started and stopped in response to the level of liquid in the tank. They can also be connected to alarm devices to prevent operational problems (overflow or unexpected dry running) **(Fig. 10).**
They must be installed well away from turbulence or inflows of water.
In the event of strong turbulence, float switches should be installed on a rigid rod mounted inside the pit.
Make sure that there are no items which may obstruct movement of the floats and that the wires do not interfere with each other, and cannot become tangled or trapped on projections inside the tank.
Float switches must be installed in such a way that the correct minimum liquid level is guaranteed.



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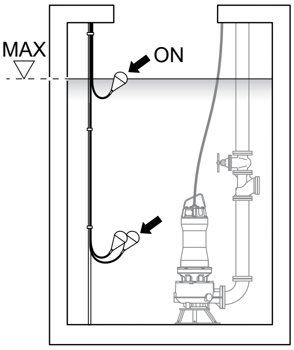
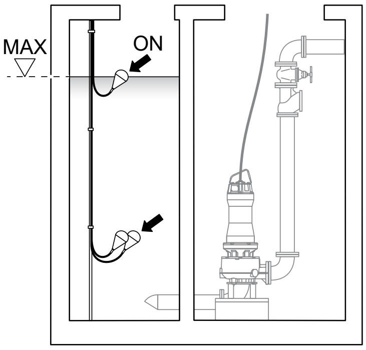
The user must ensure that the pump operates always with the minimum level of pumped liquid controlled by two level sensors (in redondancy) to shut down the power supply when the liquid to be pumped belows the minimum level.
Only use level sensor according with the -Ex classification of the installation site.
The connection to the electric control panel must be carried out using an Intrinsic Safe Circuit such as a Zener safety barrier or a galvanic isolation barrier.

Ensure that the switch **from shut down to start-up**
occurs only and exclusively if the floats find themselves in the position shown in **Fig 11A, 11B, 11C.**
Ensure that the switch **from start-up to shut down**
occurs only and exclusively if the floats find themselves in the position shown in **Fig 12A, 12B, 12C.**
The electric connection of the floats must be carried out in such a way that ensures the shutdown of the pump in cases of a malfunctioning float.

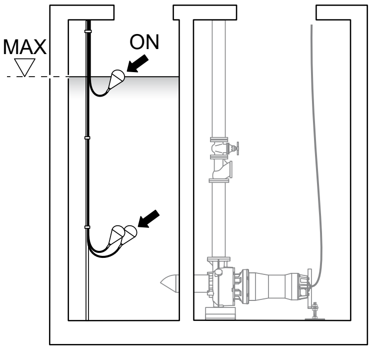
⚠ Make sure that effective volume of the tank does not become so low that the number of starts per hour exceeds the maximum admitted.



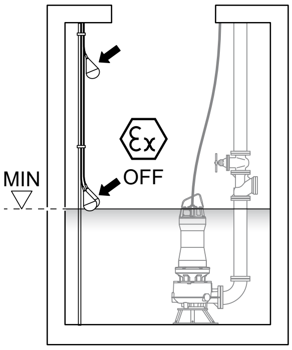
11 A



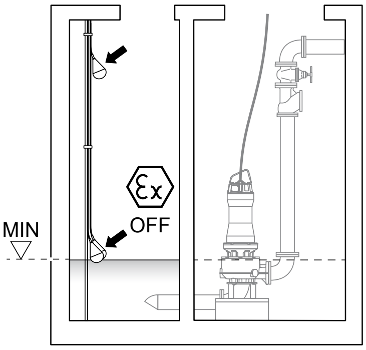
11 B



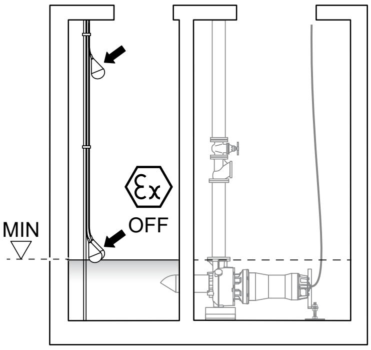
11 C



12 A



12 B



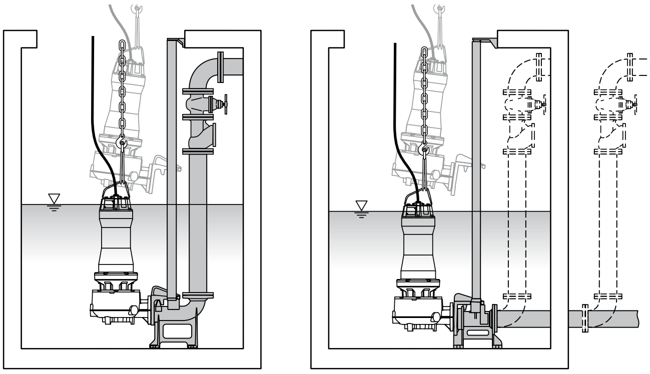
12 C

3.4 Permitted installation types

Make sure that the atmosphere in the working area is not potentially explosive.

3.4.1 Installation with DAC coupling device

With this type of installation **(Fig. 13)**, the pump can be removed from and replaced in the tank quickly without any work on the system.



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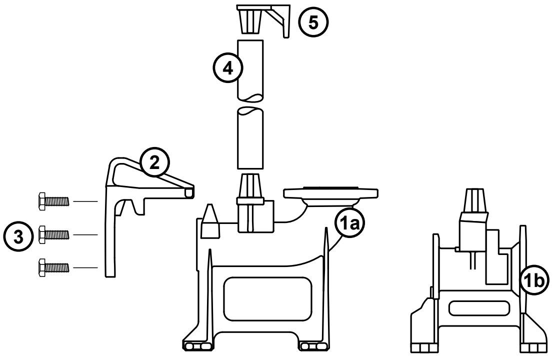
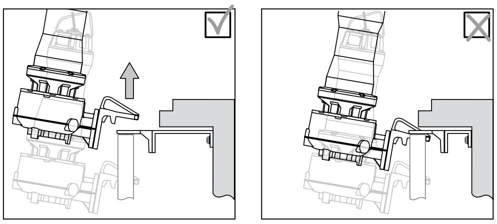


1a. DAC V coupling device (vertical outlet)
1b. DAC H coupling device (horizontal outlet)
2. Coupling flange
3. Screws
4. Pipe guides (not included)
5. Spacer bracket

Installation procedure (See APPENDIX 1 page 130)

1. Check that the pump is disconnected from the power supply panel and the impeller turns in the correct direction using the procedure described in the manual.
2. Fix the flange to the pump’s outlet with the screws provided.For models with hooks, fix the hook to the pump body using the screws provided.
3. Place the coupling device on the bottom of the tank and mark the position of the holes required to fix it.
4. Make holes of suitable diameter for the coupling device fixing slots and secure it firmly to the bottom of the tank using chemical or expansion plugs. Use stainless steel metal fasteners or protect the screws and nuts with a suitable product to prevent corrosion.
5. Connect the outlet pipeline to the coupling device. A shut-off valve and a ball type check valve with full free passage should be installed using a connection pipe with length equal to at least 5 times the diameter of the outlet.
6. Fit the pipe guides, cut to the correct length, to the coupling device. Galvanised steel pipes, or preferably stainless steel pipes, of suitable diameter can be used (see technical information).
7. Connect the spacer bracket to the top end of the pipe guide and mark the positions of the holes required to fix it to one of the sides of the tank; make sure that the pipe guides are perfectly vertical with the aid of a plumb-line or a spirit-level.

CAUTION **Before connecting the bracket spacer check, by lifting the pump up, if it is possible to extract the coupling flange from the pipe guides (Fig. 14).**



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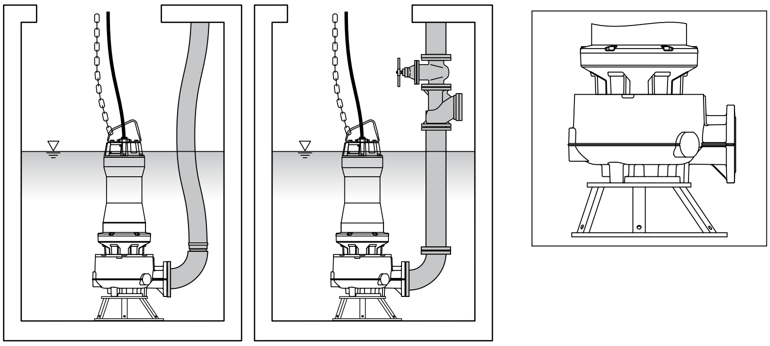
8. Make holes of suitable diameter for the spacer bracket fixing slots and secure it firmly using chemical or expansion plugs. Protect the screws and nuts with a suitable product to prevent corrosion.
9. Clean the tank to remove any remaining debris and waste.
10. Secure a chain or sling of suitable size to the handle and lower the pump into the tank, sliding the flange along the pipe guides until it reaches the coupling device.
11. Secure the electric cables so that they cannot be twisted or torn or drawn in by the pump.
12. Bring the cables out of the tank through a clean, smooth duct. Do not lay cables with tight bends or in positions with risk of crushing or damage.
13. Connect the electric cables to the control panel.

3.4.2 Mobile installation

In mobile installation **(Fig. 15)** the pump is mounted on a specific base which keeps it vertically on the bottom of the tank and ensures that the intake is at the correct height.



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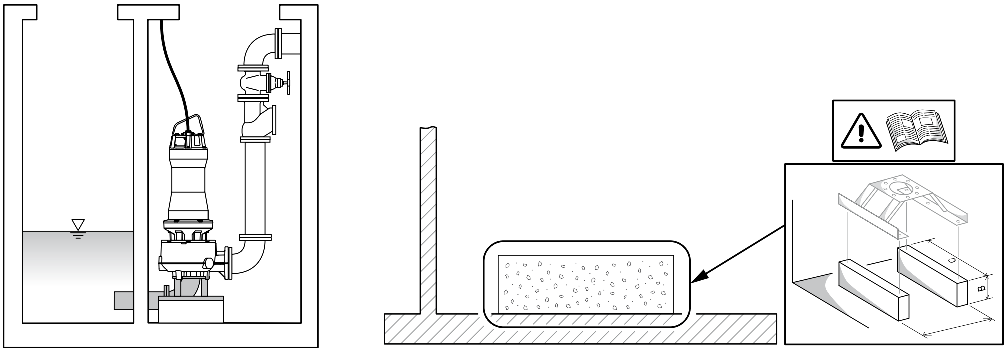
Installation procedure (See APPENDIX 2 page 131)

1. Check that the pump is disconnected from the power supply panel and the impeller turns in the correct direction using the procedure described in the manual.
2. Lower the pump onto the base using a chain or sling of suitable strength secured to the handle. Ensure that it cannot fall and/or swing.
3. Secure the pump to the base with the screws provided.
4. Connect the outlet to the piping using the standardised flange. Use stainless steel metal fasteners or protect the screws and nuts with a suitable product to prevent corrosion. A shut-off valve and a ball type check valve with full free passage should be installed using a connection pipe with length equal to at least 5 times the diameter of the outlet.
5. If a hose is used, fit a flanged hose connector. A hose with reinforcing coil or semi-rigid hose is recommended to ensure that the free passage remains constant even at bends in the hose or points where it changes direction. Secure the hose to the union by means of a metal band clamp.
6. Lower the pump into the tank until it rests firmly on the bottom using a chain or sling of suitable strength secured to the handle. Ensure that the pump cannot fall and/or swing.
7. Secure the electric cables so that they cannot be twisted or torn or drawn in by the pump.
8. Bring the cables out of the tank through a clean, smooth duct. Do not lay cables with tight bends or in positions with risk of crushing or damage.
9. Connect the electric cables to the control panel.

3.4.3 Vertical installation in dry chamber

For vertical installation in a dry chamber **(Fig. 16)**, the pump is supplied, on request, with intake flange designed for fixing to a curved base (KBC).



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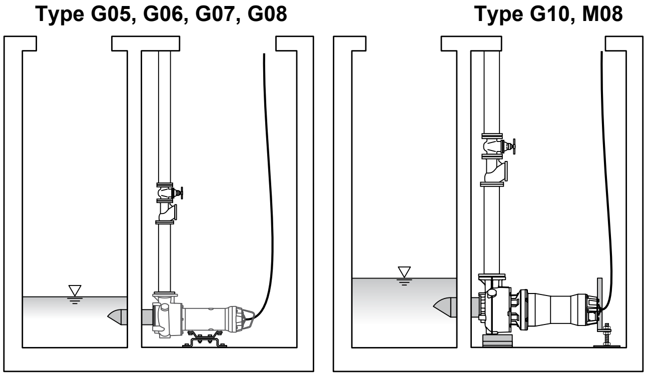
Installation procedure (See APPENDIX 3 page 132)

1. Construct two supports on the bottom of the tank in a material which will support the weight of the pump and the stresses which it generates (cement, concrete, brickwork, etc.), in order to set the intake port at the correct height. The recommended dimensions are provided in the technical information sheet.
2. Check that the pump is disconnected from the power supply system and that the impeller turns in the correct direction using the procedure described in the manual.
3. Place the pump on the base and secure it with the fixing screws.
4. Connect the flanged elbow to the pump intake port with the fixing screws. If necessary, lay the pump on its side and fix it in position to prevent accidental movements.
5. Secure a chain or sling of suitable strength to the pump handle and lower the pump into the tank, placing the base on the supports in the bottom.
6. Mark the positions of the mounting holes.
7. Make holes of suitable diameter for the base fixing slots.
8. Fix the base firmly to the two supports using chemical or expansion plugs. Use stainless steel metal fasteners or protect the screws and nuts with a suitable product to prevent corrosion.
9. Connect the intake pipeline to the flanged elbow;

10. Connect the discharge pipeline to the pump.A shut-off valve and a ball type check valve with full free passage should be installed using a connection pipe having length at least 5 times the inside diameter of the discharge port).
11. Clean the tank to remove any remaining debris and waste.
12. Secure the electric cables so that they cannot be twisted or torn.
13. Bring the cables out of the tank through a clean, smooth duct. Do not lay cables with tight bends which may be crushed or damaged.
14. Connect the electric cables to the control panel.

3.4.4 Horizontal installation in dry chamber

For horizontal installation **(Fig. 17)**, the pump has a fitting for fixing to the supporting metal structural work (KBS-H).



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Installation procedure (type G05, G06, G07, G08) (See APPENDIX 4 page 133)

1. Check that the pump is disconnected from the power supply panel and the impeller turns in the correct direction using the procedure described in the manual.
2. Secure the lower bracket to the bottom of the tank. Use stainless steel metal fasteners or protect the screws and nuts with a suitable product to prevent corrosion.
3. Secure the upper bracket to the electric pump.
4. Put the pump horizontal positioning upper bracket against the lower.
5. Secure firmly the brackets with screws.
6. Connect the intake and outlet pipelines. A shut-off valve and a ball type check valve with full free passage should be installed using a connection pipe with length equal to at least 5 times the diameter of the outlet.
7. Clean the tank to remove any remaining debris and waste.
8. Secure the electric cables so that they cannot be twisted or torn.
9. Bring the cables out of the tank through a clean, smooth duct. Do not lay cables with tight bends or in positions with risk of crushing or damage.
10. Connect the electric cables to the control panel.

Installation procedure (type G10, M08) (See APPENDIX 4 page 133)

1. Check that the pump is disconnected from the power supply panel and the impeller turns in the correct direction using the procedure described in the manual.
2. Position the pump vertical on a firm, even surface.
3. Unscrew the screws which secure the lifting handle, if present, and remove it. As an alternative, unscrew and remove the eyebolts.
4. Secure the top bracket to the motor lid of the electric pump. Be very careful not to damage the electric cables.
5. Secure the spacer to the top bracket without tightening the fixing nuts.
6. Secure the bottom bracket to the body of the pump.
7. Using a plumb line, adjust the position of the spacer so that its supporting plate lines up with the bottom bracket; tighten the spacer nuts
8. Put the pump in position by using a suitable mechanical device (crane, tackle). Lift with a chain or sling of suitable size for the weight of the pump. Take care since the pump, fixed to the metal structure, may swing as it is lifted off the ground.
9. Fix the system firmly to the bottom of the tank using chemical or expansion plugs. Use stainless steel metal fasteners or protect the screws and nuts with a suitable product to prevent corrosion.
10. Connect the intake and outlet pipelines. A shut-off valve and a ball type check valve with full free passage should be installed using a connection pipe with length equal to at least 5 times the diameter of the outlet.
11. Clean the tank to remove any remaining debris and waste.
12. Secure the electric cables so that they cannot be twisted or torn.
13. Bring the cables out of the tank through a clean, smooth duct. Do not lay cables with tight bends or in positions with risk of crushing or damage.
14. Connect the electric cables to the control panel.

4. ELECTRICAL CONNECTIONS

4.1 General safety precautions

All the procedures involved in connecting the unit to the electrical mains must be carried out by skilled staff in accordance with the relevant legal requirements: incorrect electrical connections may cause fires and an electrocution hazard, or the risk of damage to the product.

- Check that the unused conductors are properly insulated and fixed in the electrical panel.
- Before installation, make sure that the power supply line voltage and frequency are as stated on the dataplate and that the power absorption of the pump is below the maximum current the system is able to deliver.
- The maximum voltage variation allowed for rated value is ± 5%
- Voltage imbalance between phases: max 2%
- The fuses and protective cut-outs must be of suitable rating for the system's characteristics.
- Protect the pump motor using an overload cut-out suitable for the electrical data provided on the dataplate.
- Make sure that the thermal protection devices are properly connected: apart from leading to forfeiture of warranty cover, failure to connect the thermal protection may constitute a hazard.
- The electrical operation and safety of ZENIT electric pumps are guaranteed for the configuration supplied by the manufacturer: any changes (e.g. addition of extra lengths of cable to the original power lead) may cause a deterioration in the pump's characteristics.

Before installation and the first startup, make sure that the electrical cables are not damaged in any way to avoid short circuit.

4.2 Wiring

- Make sure that the electrical cables have not be exposed to damp and/or immersed in water.
- The cable's free terminals must be connected to a control panel with a degree of insulation suitable for the installation environment.
- Secure the electric cables so that they cannot be twisted, torn and/or crushed.
- If the cable is damaged, do not replace it; contact Zenit or an Authorised Service Centre.
- Do not underestimate the problems caused by voltage drops.

The ends of the power supply cable must be connected to an electric panel certified for use in potentially explosive atmospheres if it is installed in a hazardous area

4.3 Ground connection

- Make sure that the ground system and differential security breaker are present and in good working order.
- Check that the ground conductor is about 150 mm longer than the other conductors so that it will be the last to become disconnected from the panel in the event of accidental tugs.

The predisposition for the connection of the external earth conductor accepts cables with a cross-sectional area of at least 4 mm².

Do not connect the ground wire to a gas pipe, water pipe, lightening rod, or telephone ground wire.
Improper grounding could cause electrical shock.

On -Ex pumps, make sure that an external earth conductor (yellow and green, with cross section at least of 4 mm²) is connected to the external earth terminal on the pump using a secure cable clamp. Clean the surface of the externa earth connection and mount the cable clamp.

4.4 Thermal protection

The equipment is equipped with thermal protectors inside the stator windings to shut down the power supply in case of motor overheating.

The standard thermal protection consists of bimetal thermal protectors with nominal switching temperature NST=150°C; as option, bimetallic protectors can be replaced by PTC thermistors or PT100 sensors.

The thermal protection cables are marked with a label stating "TP" = THERMAL PROTECTION and must be connected to the corresponding terminals of the control panel.

The connection of the thermal protectors to a control panel is mandatory. The electric panel must be predisposed to guarantee the shutdown of the motor when the thermal protection intervenes and to avoid the automatic start-up of the pump which must only be started manually with the intervention of a technician after having fixed the causes of the anomaly.

4.5 Leakage detector

The electric pump can be equipped with a single-electrode leakage detector as an accessory to detect and signal the infiltration of water into the oil chamber of the mechanical seals (the equipment grounding conductor is used as the return path for the conductive level limit detection).

In the case of detection, take out of service the pump and proceed with maintenance.

The signal cable is marked with a label with the letter **S.**

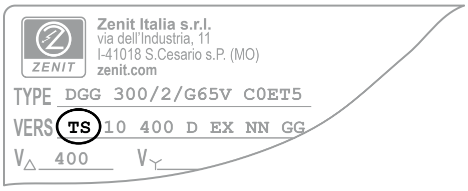
For installations with -Ex certified models, the connection to the electric control panel must be carried out by inserting in safe area an Intrinsic Safety barrier with galvanic isolation.

Electrical safety data for intrinsically safe circuit:

Leakage detector	U_i: 30V; I_i: 120mA; P_i: 1.3W C_i: 0.3nF; L_i: ~ 0mH
Cable	C_c: 200pF/m; L_c: 1µH/m; L_c/R_c= 30µH/Ω

4.6 Electrical connection

To make the electrical connection to the pump, proceed as follows:
1. Check the electrical variant required on the dataplate (VERSION field) **(fig. 18);**
2. First connect the ground conductor to the relative control panel terminal in accordance with the wiring diagram;
3. Connect the power supply conductors to the relative control panel terminals in accordance with the wiring diagram;
4. Connect the control device conductors to the terminals of the relative panel.


Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
ZENIT
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⅄

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N.B. Comply carefully with the connections shown in the wiring diagram.
For Non-standard sensors and protective devices please refer to the specific documentation supplied with the unit.

WIRING DIAGRAMS PAGE 123

5. COMMISSIONING

CAUTION Before carrying out any operation, make sure that the pump and electrical panel are disconnected from the electrical mains and cannot be accidentally powered up.

Before you start the pump, the following requirements must be met:
- There is oil in the mechanical seals oil chamber (see point 6.5.3).
- Check that the impeller can turn freely.
- The machine is fixed to the installation system.
- The monitoring equipment incorporated in the product is correctly connected.

5.1 General safety precautions

- All operations must be carried out by skilled technical staff.
- The pump must always be used with the safety devices installed and in good working order.
- Keep objects and people at a safe distance from the machines installed and do not allow people or animals to come into contact with the liquid in which they are immersed.
- Check that the impeller turns in the correct direction using the procedure described in the manual.

5.2 Starting the electric pump

The pumps must not be started if the atmosphere in the working area is potentially explosive.

Once installation is complete, the system should be tested to ensure that it is fully operational.
The pump must always be used with the safety devices installed and in good working order; make sure that all protective equipment has been connected correctly.
The pump must not run dry; check that the liquid level is above the motor.
Check that the required gate valves (where fitted) fuction are open.
Switch on the power supply and let the pump run briefly and:
- check that the input current is within the limit stated on the dataplate;
- check whether the monitoring units are operating satisfactorily (no alarms or warnings);
- check the setting of the level control system (minimum and maximum levels).

CAUTION The maximum permitted number of starts per hour must be complied with to prevent damage to the motor.

CAUTION In case of abnormal noise or vibration from the pump, other pump failure, alarms or warnings, stop the pump immediately and do not restart it until the cause of the anomalies are found and fixed.

5.3 Acoustic pressure level

The pump's acoustic pressure level when in operation is below 70 dB.
However, in some systems and in some duty points on the performance curve this threshold may be exceeded.
Check the permitted acoustic pressure level in the environment where the product is installed to avoid breaching local legal requirements.

6. MAINTENANCE AND SERVICE

6.1 Introduction

Regular maintenance and inspections are indispensable to maintaining the pump's performance. For this reason, the complete unit should be cleaned thoroughly on a regular basis, maintained and inspected.
If the pump behaves differently from its normal operating condition, refer to section ”7. Troubleshooting guide” of this manual and take appropriate measures at an early stage.
Do not use the pump if malfunctioning because sudden failure of the rotating parts may cause hazardous situations or damage to the motor.

CAUTION The instructions for inspection and maintenance of these pumps must never be viewed as “Do-It-Yourself” procedures; they require specific technical knowledge.

NOTE: the inspection and replacement of spare parts require specialized equipment. To have this operation performed, contact the dealer where this equipment was purchased, or the Zenit sales office in your area.

Inspection and repairs of -Ex equipments shall be carried out in accordance with:

- **EN 60079-17: Explosive atmospheres - Part 17: Electrical installations inspection and maintenance**
- **IEC 60034-23: Rotating electrical machines – Part 23: Repair, overhaul and reclamation**
- **EN 60079-19: Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation**

Any interventions of the pump in -Ex versions must be carried out by an Ex-Certified Service Centre (according with international and/or local standards and rules) or by a Zenit Service Centre by trained technicians using only original spare parts. Failure to comply with this rule causes loss of -Ex approval.

6.2 General safety precautions

- Before starting any work on pumps used in liquids which could constitute a hazard to health, carry out thorough cleaning and venting of pump, tank, etc. according to local regulations;
- Before cleaning and/or maintenance procedures, a skilled technician must disconnect the pump from the power supply and ensure that it cannot start up accidentally;
- Always disconnect the phase wires first and then the yellow-green ground wire;
- Ensure that the pump cannot fall or roll, causing injury or damage;
- Wash the surface of the pump thoroughly with clean water and/or specific detergent before doing any work on it.
- After prolonged use, the surface of the pump may become very hot: allow it to cool sufficiently to avoid burns;
- Always comply with the safety regulations in force in the place of installation, any local regulations and the dictates of common sense.

6.3 Planned maintenance and service

Maintenance intervals depend on the type of installation, the workload to which the pump is subjected and the type of liquid in which it is immersed. During planned maintenance or in any circumstances when the pump's performance deteriorates or its vibrations and noise level increase, the parts subject to wear and tear must be inspected; have this done by an Authorised Service Centre.

<table>
<tr><th rowspan="2">Interval</th><th colspan="2">Inspection Item</th></tr>
<tr><th>Standard pump</th><th>-Ex pump</th></tr>
<tr><td rowspan="2">Weekly</td><td colspan="2">Measuring the operating current: to be within the rated current.</td></tr>
<tr><td colspan="2">Measuring the power supply voltage: within ± 5% of the rated voltage.</td></tr>
<tr><td>Monthly</td><td colspan="2">Inspecting the pump:
• If the pump's performance has diminished significantly, the propeller may be worn or the impeller may be clogged with debris. Remove any debris and replace the part if it is worn
• Inspecting cables: refer to section 8.4 "electric cable inspection"
• Measuring the insulation resistance: Insulation resistance reference value = 20 MΩ minimum
<i>NOTE: The motor must be inspected if the insulation resistance is considerably lower than the last inspection</i></td></tr>
<tr><td rowspan="5">Once ever 6 months or 3,000 hours, whichever comes first</td><td colspan="2">Cleaning and inspection of lifting chain or rope:
- Replace if damage, corrosion, or wear has occurred to the chain or rope.
- Remove if foreign object is attaching to it.</td></tr>
<tr><td colspan="2">Check winches, hooks and chains for signs of failure or wear and corrosion. Clean or lubricate them if necessary and replace any damaged components. Remove if foreign object is attaching to it.</td></tr>
<tr><td colspan="2">Verify that the bolts, nuts and screws are properly tightened. When tigthening, renew the threadlocker if necessary.</td></tr>
<tr><td colspan="2">Check the fasteners on the bottom every time the tank is empty.</td></tr>
<tr><td></td><td>Inspecting cable, oil, mechanical seals, bearings, wearing parts (impeller, suction flange….):
If the oil contains water, inspect mechanical seal. Refer to section 8.6 "Oil inspection".
<i>NOTE: rubber parts need to be replaced if disassembled during inspection</i></td></tr>
<tr><td>Yearly</td><td>Inspecting cable, oil, mechanical seals, bearings, wearing parts (impeller, suction flange….).
If the oil contains water, inspect mechanical seal. Refer to section 8.6 "Oil inspection".
<i>NOTE: rubber parts need to be replaced if disassembled during inspection</i></td><td></td></tr>
<tr><td rowspan="3">Once every 2 years or 9000 hours, whichever comes first</td><td colspan="2">Changing oil
<i>NOTE: Refer to section "Oil inspection and change procedures" for further details.</i></td></tr>
<tr><td colspan="2">Changing the mechanical seals
<i>NOTE: The inspection and replacement of the mechanical seals requires specialized equipment. To have this operation performed, contact the dealer where this equipment was purchased, or the Zenit sales office in your area.</i></td></tr>
<tr><td></td><td>Changing bearings</td></tr>
<tr><td>Once every 2 to 5 years</td><td colspan="2">Overhaul:
The pump must be overhauled even if appears normal during operation. Especially, the pump may need to be overhauled earlier if it is used continuously.</td></tr>
</table>

6.4 Cleaning

Remove any debris attached to the pump's surface, and wash the pump with tap water. If the hydraulic part is fouled, clean it thoroughly. Pay particular attention to the hydraulic parts and completely remove any debris .
If the pump is used only occasionally, after each use flush out the hydraulic part to prevent the formation of deposits; run the pump for a few cycles with clean water.
Also take care not to allow sediments to form on the float switches, to ensure that the start and stop thresholds remain correct.

6.5 Inspection

Verify that there is no damage, and that the bolts, nuts and screws are properly tightened. Tighten screws with correct tightening torques (see Point 6.6). When tigthening, renew the threadlocker if necessary.

6.5.1 Electric cable inspection

Cables and their terminations are particularly prone to damage. They shall be inspected at regular intervals and whenever is possible.
Check that the electric cable is intact with no signs of pulling, cuts or other signs of misuse.
A faulty cable may enable liquids to enter the unit and may cause electrical leakage, short circuit, electrical shock or fire.
Check that the cable gland is intact.
Damaged or defective parts shall be replaced immediately.

6.5.2 Bearings inspection

All bearing are rolling element type grease lubricated for life. Check the shaft noisy or heavy operation (turn the shaft by hand) and in case, replace the defective ball bearings.

Defective bearings may reduce the -Ex safety.

6.5.3 Oil inspection and changing procedure

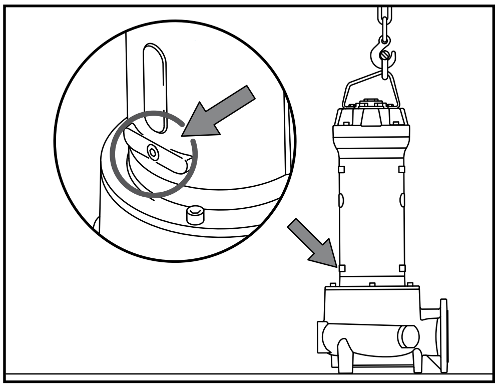
Oil change and mechanical seals inspection is necessary if the leakage probe detects an ingress of water into the seal chamber.
Oil chamber is designed in order than, filling it with the pump in vertical position, the right quantity of the lubricate is reached when its level reach the hole for the filling (oil plug).

Use TOTAL Bio Hydraulic TMP FR46 oil or equivalent with ISO Viscosity Grade (Kinematic Viscosity at 40°C) 40-90 cSt, Flash point ≥ 240°C.
If the recommended oil is not available, contact Zenit.

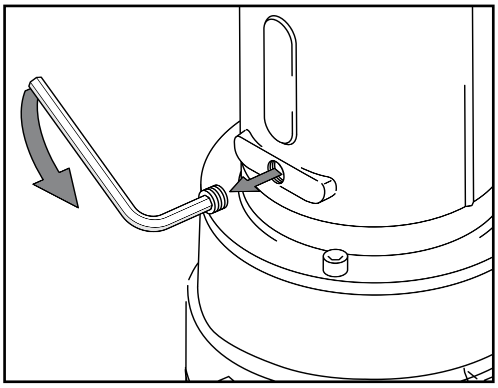
The oil chamber may become pressured in the event of a leak from the mechanical seal.
Unscrew the plug slowly, covering it with a rag of suitable size.

Do not dump spent oil in the environment, but consign it to a specialist disposal centre.

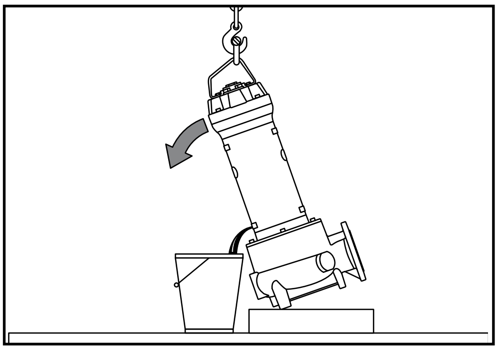
Oil changing procedure
Enclosure type G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L



1. Position the pump on a firm, even surface;Use a suitable lifting system of appropriate size.
   Secure it to prevent it from rolling or rocking.
2. Identify the plug of the pump's oil chamber.

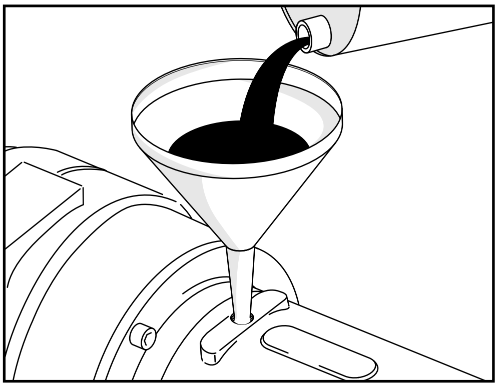


3. Unscrew the plug on the top of the oil chamber.



4. Allow the oil to drain into a vessel of suitable size, transparent if possible.

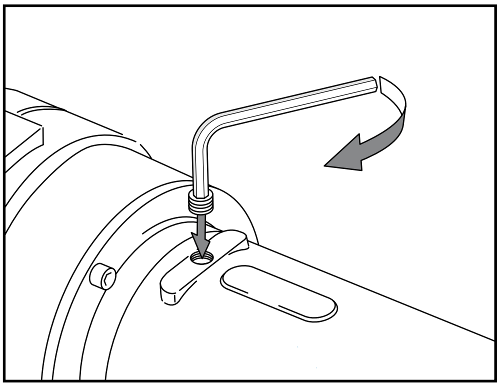
5. Place the vessel containing the oil on a horizontal surface and let it stand for a few minutes to allow any water in it to settle to the bottom:
    - Oil clean and free from water: the mechanical seal is in good condition and new oil can be placed in the system.
    - Oil with a very little water: this may be due to bedding-in of the mechanical seal during the initial operating hours, creating a negligible amount of water.
    - Oil containing water and dirt; the mechanical seal must be inspected and replaced with a new one. The replacement must be made by an authorised Service Centre;



6. Lay the pump horizontal on the workbench

7. Fill the mechanical seal chamber with biodegradable lubricating oil

Enclosure type	Mechanical seal chamber oil capacity (ml)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

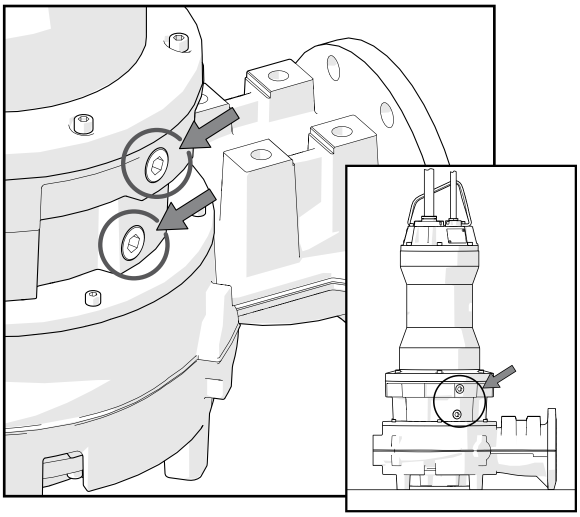


8. Screw the top plug onto the oil chamber.

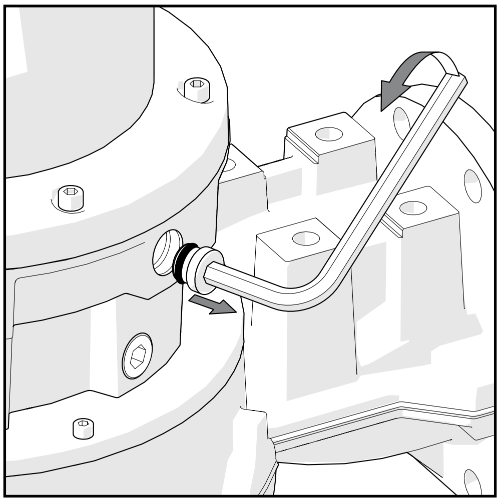
CAUTION **Use Loctite 243 threadlocker**

Enclosure type	Oil chamber plug
G05M - G05L **G06S - G06L** **G07S - G07L** **G08L**	1/8” NPT
G10S - G10L	3/8” DIN 906

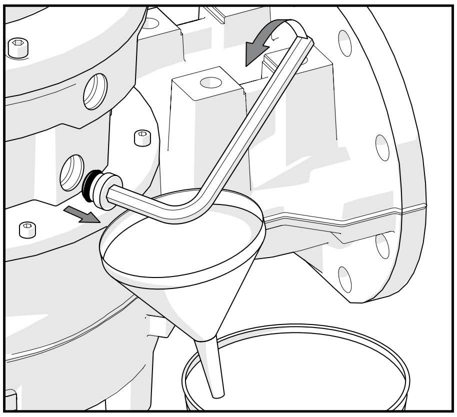
Oil changing procedure
Enclosure type M08S - M08L



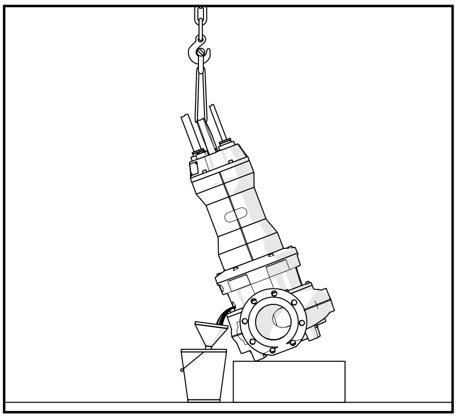
1. Position the pump on a firm, even surface;Use a suitable lifting system of appropriate size.
   Secure it to prevent it from rolling or rocking.
2. Identify the plugs of the pump’s oil chamber.



3. Unscrew the plug on the top of the oil chamber.



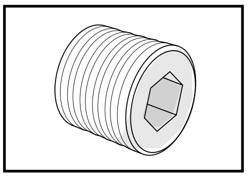
4. Unscrew the plug on the bottom of the oil chamber.



5. Allow the oil to drain into a vessel of suitable size, transparent if possible.

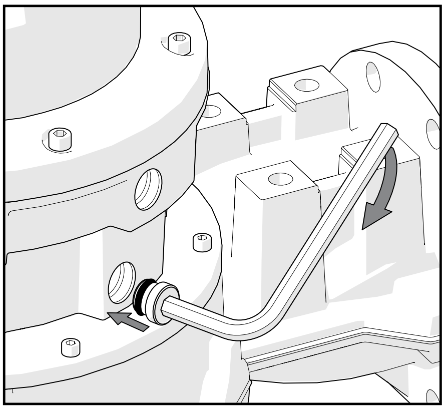
NOTE: to check that the vessel is of sufficient capacity, refer to the Table for the amount of oil in the chamber.

6. Place the vessel containing the oil on a horizontal surface and let it stand for a few minutes to allow any water in it to settle to the bottom:
   - Oil clean and free from water: the mechanical seal is in good condition and new oil can be placed in the system.
   - Oil with a very little water: this may be due to bedding-in of the mechanical seal during the initial operating hours, creating a negligible amount of water.
   - Oil containing water and dirt; the mechanical seal must be inspected and replaced with a new one. The replacement must be made by an authorised Service Centre;

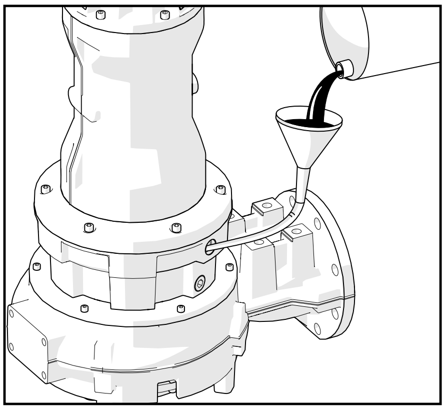


Enclosure type (WET)	Oil chamber plug
M08S - M08L	2x 3/8” DIN 906

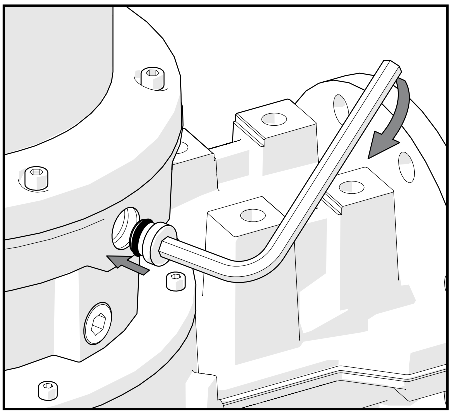
CAUTION **Use Loctite 243 threadlocker**



7. Screw the bottom plug onto the oil chamber.



8. Fill the mechanical seal chamber with biodegradable lubricating oil



9. Screw the top plug onto the oil chamber.

Enclosure type	Mechanical seal chamber oil capacity (ml)
M08S - M08L	2300

6.6 Fasteners

For replacement purpose, the fasteners shall be Class A2 70, A2 80, A4 70 or A4 80 according to ISO 3506-1.

Tightening torques (Nm)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. DISPOSAL

Properly dispose of the product by disassembling it, presorting the contents, and sending them to the waste material treatment site. Use the public or private waste collection service in accordance with the relevant local laws and regulations.

The crossed bin symbol on the equipment, or its packaging, indicates that the product must be collected separately from other waste at the end of its useful life and not with mixed urban waste.

Appropriate waste sorting for the subsequent recycling, treatment and disposal in an environmentally sound way of the disused equipment avoids negative effects on the environment or human health and favours the re-use or recycling of the equipment’s materials.
A decision on disposal is made upon results of set of measures including examination of control device condition and remaining lifetime estimation Disposal (salvage) of pumps is carried out in accordance with the relevant national regulations.

8. TROUBLESHOOTING GUIDE

	Problem	Possible cause	Solution
1	The pump fails to start or, starts but stop immediately	No proper power is supplied (i.e. power outage, voltage drop, etc.)	Contact a skilled electrician
		Power cable is faulty or disconnected	Inspect the cable and check that the connections to power line are properly tightened
		Malfunction in control system (control panel).	Have the cause investigated and repaired by a skilled electrician
		Fuses blowed	Check fuses type and rating and replace them with correct ones
		Tripped circuit breaker	Refer to Point 2
		Tripped thermal protector	Refer to Point 3
		Leakage detector alarm	Refer to Point 4
		Tripped residual current device (RCD)	Refer to Point 5
		Damaged or wrongly connected ca- pacitor (single phase motor)	Contact a skilled electrician to replace the capacitor and check that it’s correctly connected
		Tripped level control	Check that the level sensors are correctly connected and functioning
2	The power supply circuit breaker trips	Phase voltages too low or not balanced	Contact a skilled electrician
		Wrong electrical connection	Contact a skilled electrician to check and correct the electrical installation
		Overload relay is set too low or is faulty	Check the overload relay. Set the relay according with the rated current on the dataplate
		Short circuit in the motor winding	Contact an authorised service center
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Blocked rotor	Contact an authorised service center
3	The thermal protection trips after a short operating time	The pump is immersed in a liquid which is too hot	Cool down the liquid
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Internal moving parts are damaged	Contact an authorised service center
		Uncorrect voltage	Check that the supplied voltage matches with the one on the pump’s dataplate
		Fault in bearings	Contact an authorised service center
		Starts per hour exceed the permitted number	Refer to Point 6
4	Tripped residual current device (RCD)	Humidity in motor.	Contact an authorised service center
		Low motor winding insulation	Contact an authorised service center
		Fault in cable	Have the cable checked and repaired by a qualified electrician

5	The pump operates but the flow is low or null	Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Clogged outlet pipe	Clean the outlet pipe
		Blocked non-return valve	Clean the non-return valve
		Outlet valve blocked or closed	Open and/or clean the outlet valve
		Wrong direction of rotation	Check the direction of rotation, interchange any two of the phases
		Leakage in the pipeline	Check the pipeline and fix the leakage causes
		Wrong pump selection	Replace the pump with a suitable one
6	Starts per hour exceed the permitted number	Wrong setting of the level control	Correct the level control setting
		Level control malfunction	check the level sensors functionality
		Turbolence near the level sensors	Remove the causes of turbulence or change the positioning of the level sensors
		Undersized tank	Adjust the tank dimension
7	Noisy operation and excessive vibrations	Internal moving parts are damaged	Contact an authorised service center
		Fault in bearings	Contact an authorised service center
		Impeller blades are dirty, damaged or worn.	Contact an authorised service center
		Blocked impeller	Clean the hydraulic parts and remove the blocking material
		Impeller rotates in the wrong direction	Check the direction of rotation, interchange any two of the phases
		Electrical phase missing	Contact a skilled electrician
		Oscillation caused by the installation	Check installation structure
8	The pump works correctly but absorbed current is too high	Wrong duty point	Make sure the pump operates within its operative range
		Uncorrect voltage	Check that the supplied voltage matches with the one on the pump's dataplate
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Fault in bearings	Contact an authorised service center
		Impeller rotates in the wrong direction	Check the direction of rotation, interchange any two of the phases
		Stator windings are faulty.	Contact an authorised service center
9	Leakage detection	Water ingress in the motor due to damaged cables, o-rings or cable glands.	Contact an authorised service center
		Water ingress in the mechanical seal chamber due to wearing or breaking down of mechanical seals or o-rings	

The following information is required when ordering repairs or making other inquires:

Product model	**Serial number**	**Purchase date**
Remarks:		

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De sorte à bien installer et utiliser le produit, lire attentivement ce manuel et le conserver soigneusement dans un endroit propre et facile d'accès pour une éventuelle consultation ultérieure.
Toute utilisation incorrecte du produit peut mettre en danger les personnes, provoquer des graves dommages matériels, entraîner des dysfonctionnements et annuler la garantie.

1. INFORMATIONS GÉNÉRALES

1.1 Identification du fabricant

ZENIT Italia S.r.l. - via dell'Industria, 11 - 41018 S.Cesario sul Panaro (Modène) - Italie

1.2 Symboles utilisés dans le manuel

⚠ Attention - Danger pour la sécurité des opérateurs et pour l'électropompe

⚡ Attention - Danger de nature électrique

♨ Attention - Surfaces très chaudes avec risque de brûlures

Ex Attention - Instructions concernant les modèles avec certification -Ex.
Le non-respect de ces instructions peut constituer un risque d'explosion.
Il est recommandé d'appliquer ces instructions y compris aux modèles standard.

ATTENTION ! Information importante qui exige une attention particulière

⚠ 1.3 Consignes générales de sécurité

- L'appareil n'est pas adapté à une utilisation par des personnes non qualifiées et/ou inexpérimentées ; tenir hors de la portée des enfants ;
- Les opérations d'installation doivent être effectuées par un personnel technique compétent et en mesure de comprendre le contenu du manuel. Les préposés à l'installation et à la maintenance du produit doivent être formés aux risques résiduels liés à l'appareillage électrique ;
- S'assurer que les personnes ne peuvent pas tomber accidentellement dans le réservoir ; installer un couvercle ou un garde-corps de protection si nécessaire ;
- Pendant les opérations de manutention, d'installation ou de démontage, l'alimentation de l'appareil doit être débranchée ;
- Faire attention au risque présenté par le gaz et les vapeurs à l'intérieur de la zone de travail ;
- Ne pas ingérer ni inhaler un quelconque composant de l'appareil ;
- Les personnes et les animaux ne doivent pas s'immerger ou entrer en contact avec le liquide tant que l'électropompe n'a pas été retirée de la cuve ;
- Ne pas mettre l'extrémité libre du câble électrique en contact avec quelque liquide que ce soit ;
- L'installation électrique doit comporter une connexion de terre efficace ;
- Avant de brancher l'alimentation électrique, s'assurer que l'appareil est correctement installé et garder une distance de sécurité ;
- Ne pas utiliser l'appareil à des fins autres que celles pour lesquelles il a été conçu et fabriqué, car le fabricant n'est pas responsable des dommages corporels ou matériels causés par l'appareil si celui-ci est utilisé d'une manière autre que celle décrite dans le manuel, ou si les instructions de maintenance et de sécurité ne sont pas respectées ; avant l'installation dans des environnements chimiquement agressifs, contacter le fabricant pour vérifier la compatibilité des matériaux ;
- Ne pas modifier l'électropompe ou des parties de celle-ci pour quelque raison que ce soit (raccords, perçage, finition, etc.) ;
- L'utilisateur doit respecter les règles de sécurité en vigueur dans le pays d'utilisation, ainsi que les règles dictées par le bon sens, et veiller à ce que le nettoyage et la maintenance périodiques soient correctement effectués ;
- Il incombe à l'installateur de vérifier les bonnes conditions ambiantes d'utilisation afin de garantir la sécurité et l'hygiène.
- Les responsabilités du personnel habilité à l'utilisation du produit relèvent du client.

1.4 Formation des préposés à l'installation et à la maintenance

Les préposés à l'installation et à la maintenance du produit doivent recevoir une formation sur les risques résiduels liés à l'appareillage électrique fonctionnant au contact de liquides biologiques.
Ils doivent également être en mesure de lire et de comprendre le contenu de la documentation technique jointe au produit, notamment les schémas électriques de raccordement.

1.5 Équipements de protection individuelle (EPI) à utiliser

Manipuler l'électropompe en portant l'équipement de protection individuelle réglementaire.
Le port de gants de protection, de chaussures de sécurité, de lunettes de sécurité à bords fermés et d'un tablier en cuir est obligatoire.
Avant de manipuler le produit déjà installé, le laver abondamment à l'eau courante et/ou avec des détergents.

1.6 Risques résiduels

Le produit a été conçu et fabriqué pour garantir une utilisation sûre et fiable.
Néanmoins, en raison de son emploi au contact de liquides dangereux pour la santé, les préposés à l'installation et à la maintenance doivent faire très attention et toujours porter l'équipement de protection individuelle réglementaire.
Pendant les interventions sur le produit, il est conseillé de prévenir la chute accidentelle de l'électropompe et de ne pas sous-estimer les risques de brûlure, d'électrocution, de noyade, d'asphyxie ou d'empoisonnement par inhalation de gaz toxiques.

⚡ ⚠ Ex **Pour réduire les risques liés à la foudre, il incombe à l'utilisateur de prendre des mesures de protection adéquates.**
Les joints -Ex ne doivent pas être réparés.
Ne pas ouvrir l'appareil en présence d'atmosphères explosives.

Pendant les opérations de manutention, d'installation ou de démontage, l'alimentation de l'électropompe doit être débranchée.

1.7 Description du produit / Domaines d'application

Ces produits sont conçus pour être utilisés dans des stations d'épuration et de relevage civiles, industrielles et municipales.
Ils sont indiqués pour le relevage et le transport des boues, des matières fécales, des eaux propres, des eaux usées et des eaux chargées contenant des corps solides ou fibreux.

Ils ne conviennent pas aux liquides alimentaires ni aux atmosphères explosibles (à l'exception des modèles certifiés antidéflagrants).

Les pompes submersibles de la série Grey ne doivent jamais être utilisées pour pomper des liquides explosifs, inflammables ou combustibles.
Les modèles -Ex sont certifiés pour une utilisation en atmosphère explosible selon le marquage figurant sur la plaque signalétique (voir paragraphe 1.12).

Cette électropompe doit être fixée sur un support ou installée dans un local spécifique. Elle n'est pas conçue pour être tenue en main pendant son utilisation.
ZENIT fournit toujours les moteurs des pompes Grey équipés d'un câble flexible pour l'alimentation électrique, les circuits de commande et de contrôle. Le presse-étoupe assure l'étanchéité ainsi qu'une fonction antidéchirure pour garantir une installation sûre. Aucun composant supplémentaire n'est nécessaire. Le raccordement à l'installation et au tableau électrique est de la responsabilité du client et doit être adapté aux caractéristiques de l'appareil.

Les pompes submersibles Grey sont classées en fonction de leur groupe hydraulique.

- Modèles DGG : pompes submersibles avec roue reculée effet vortex et passage libre ample
  Applications : liquides biologiques chargés et eaux d'égout dans les stations de relevage civiles et industrielles, les stations de traitement des eaux usées et les élevages d'animaux ;
- Modèles DRG : pompes submersibles avec roue à canaux
  Applications : eaux usées industrielles et eaux de processus, stations de relevage civiles, drainage et relevage des eaux usées dans les bassins de première pluie ;
- Modèles GRG : pompes submersibles avec roue multicanaux et broyeur
  Applications : relevage de liquides contenant des fibres ou des corps filamenteux dans les applications professionnelles et industrielles ou dans les élevages d'animaux ;
- Modèles APG : pompes submersibles avec roue multicanaux à grande hauteur d'élévation
  Applications : relevage d'eaux claires et sableuses, eaux de pluie et d'infiltration

1.7.1 Identification du modèle

La pompe peut être identifiée grâce aux informations figurant dans les champs TYPE et VERS de la plaque signalétique. Voir paragraphe 1.12

Type

DGG 300/2/G65V C0ET5
(A) (B) (C)
① ② ③ ④ ⑤⑥⑦⑧⑨

① Type de roue
DG = Vortex
DR = À canaux
GR = Avec broyeur
AP = À grande hauteur d'élévation
② Série
G = Grey

③ Puissance (HPx100)/pôles moteur
④ Refoulement
(A) TYPE (filetage GAZ/Bride)
(B) DIAMÈTRE (mm)
(C) POSITION
V = verticale H = horizontale

⑤ Variante hydraulique
⑥ Version hydraulique
⑦ Taille du moteur
⑧ Phases du moteur
M = Monophasé T = Triphasé
⑨ Fréquence
5 = 50 Hz 6 = 60 Hz

Version

TS 10 400 D EX NN GG
⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Variante électrique
⑪ Longueur de câble (m)
⑫ Tension nominale

⑬ Démarrage
D = DOL (direct)
Y = étoile/delta
⑭ Certification
NN = standard
EX = ATEX, ATEX + IECEx
CX = IECEX

⑮ Personnalisations
⑯ Matériau roue

1.8 Données techniques

Les caractéristiques et les données techniques du produit figurent dans la fiche technique.
Le tableau suivant indique les types de carcasse en fonction de la taille du moteur.

Version MONOPHASÉE

Type	Description _ ②③_⑦⑧_	P2 (kW)/ pôles
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

Version TRIPHASÉE

Type	Description _ ②③_⑦⑧_	P2 (kW)/ Pôles
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

Version TRIPHASÉE

Type	Description _ ②③_⑦⑧_	P2 (kW)/ Pôles
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

1.9 Conditions de fonctionnement

Pour un usage correct de la pompe, respecter les conditions de fonctionnement ci-après :

- Température du liquide/ambiante : 0 ÷ +40°C
- pH : 6 ÷ 14
- Service : Modèles monophasés : S1 - pompe entièrement immergée **(Fig. 1)**
  Modèles triphasés : S1 - : pompe entièrement immergée **(Fig. 1)**
  S3 - corps de pompe entièrement immergé ou rempli **(Fig. 2A, 2B, 2C)** selon la valeur S3% figurant sur la plaque signalétique, indiquée sur le **Tableau 1.**
- Démarrages/heure : max. 20 pour les moteurs de puissance P2 jusqu'à 10 kW, max. 15 pour P2 supérieure à 10 kW

1.10 Conditions particulières

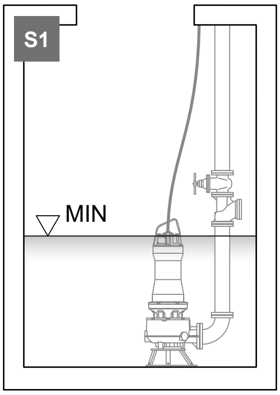
L’électropompe ne peut fonctionner en service continu (S1) que si elle est entièrement immergée. Dans le cas d'une installation à sec, l'appareil doit fonctionner sur service intermittent périodique (S3).

Il convient d'utiliser au moins deux capteurs de niveau (redondants) pour interrompre l'alimentation dès que le niveau de liquide descend sous la hauteur minimum :

S1 : pompe entièrement immergée **(Fig. 1)**

S3 - corps de pompe entièrement immergé ou rempli **(Fig. 2A, 2B, 2C)**

ATTENTION ! **Toujours contrôler que la pompe fonctionne avec la bonne hauteur de liquide minimum (voir paragraphe 3.3) Il est préférable de toujours s’assurer du bon fonctionnement de l’électropompe en conditions de hauteur minimum. En fonction de l’installation, plusieurs mesures pourraient être nécessaires pour éviter la formation de tourbillons et l’infiltration d’air à l’aspiration de l’électropompe.**



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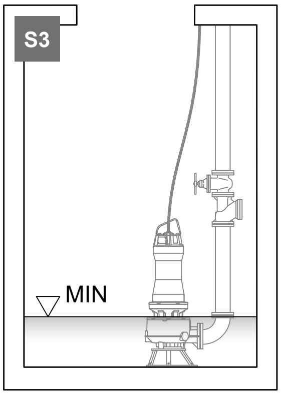
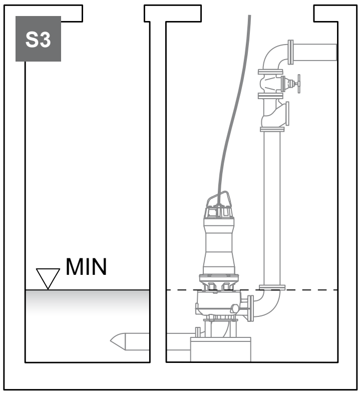
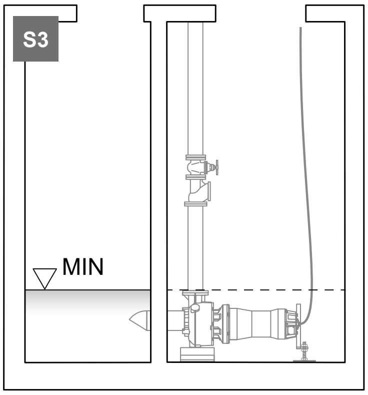


2A



2B



2C

Pour interrompre l'alimentation en cas de surchauffe du moteur, l'appareil est équipé, de série, d'une protection thermique à l'intérieur de l'enroulement du stator (voir paragraphe 4.4)

L'utilisateur doit obligatoirement brancher les protections thermiques sur un tableau électrique muni d'un bloc différentiel et programmé pour prévenir la remise en marche automatique de l'appareil.

Fonctionnement par inverseur : les protections thermiques doivent être correctement branchées sur un tableau électrique de sorte à interrompre l'alimentation en cas de surchauffe du moteur.

Les pompes Grey sont équipées d'une sonde d'humidité pour détecter la présence d'eau à l'intérieur de la chambre à huile (compartiment garnitures mécaniques).

La sonde d'humidité doit être branchée correctement en suivant les instructions qui figurent au paragraphe 4.5.

Les vis et goujons doivent être de la classe A2-70, A2-A80, A4-70 ou A4-80 selon la norme EN ISO 3506-1

La pompe en version -Ex peut fonctionner en service S3 selon la valeur S3 % figurant sur la plaque signalétique, comme indiqué sur le tableau suivant :

TABLEAU 1 : Service S3 pour modèles version -Ex

Type carcasse	Description _ ②③_⑦⑧_	P2 (kW)/ Pôles	Service
G05M	_G 75/2_AT_	0.55/2	50 %
	_G 100/2_AT_	0.75/2	50 %
G05L	_G 150/2_AT_	1.1/2	30 %
	_G 200/2_AT_	1.5/2	30 %
	_G 250/2_AT_	1.8/2	20 %
	_G 100/4_AT_	0.75/4	15 %
	_G 150/4_AT_	1.1/4	15 %
	_G 200/4_AT_	1.5/4	15 %
G06S	_G 300/2_ET_	2.2/2	20 %
	_G 200/4_ET_	1.5/4	20 %
G06L	_G 400/2_ET_	3/2	20 %
	_G 250/4_ET_	1.8/4	20 %
	_G 300/4_ET_	2.2/4	20 %
	_G 400/4_ET_	3/4	15 %
G07S	_G 550/2_FT_	4/2	20 %
	_G 750/2_FT_	5.5/2	15 %
G07L	_G 1000/2_FT_	7.5/2	10 %
	_G 550/4_FT_	4/4	15 %
	_G 750/4_FT_	5.5/4	15 %

Type carcasse	Description _ ②③_⑦⑧_	P2 (kW)/ Pôles	Service
G08L	_G 1200/2_GT_	9/2	15 %
	_G 1500/2_GT_	11/2	15 %
	_G 1750/2_GT_	13/2	10 %
	_G 1000/4_GT_	7.5/4	15 %
G10S	_G 2000/2_HT_	15/2	10 %
	_G 1200/4_HT_	9/4	15 %
	_G 1500/4_HT_	11/4	10 %
	_G 1000/6_HT_	7.5/6	10 %
G10L	_G 2500/2_HT_	18.5/2	15 %
	_G 2000/4_HT_	15/4	15 %
	_G 1200/6_HT_	9/6	15 %
	_G 1500/6_HT_	11/6	15 %
	_G 1750/6_HT_	13/6	15 %
M08S	_G 400/6_GT_	3/6	20 %
M08L	_G 550/6_GT_	4/6	20 %
	_G 750/6_GT_	5.5/6	20 %

1.11 Couverture de la garantie

ZENIT garantit le fonctionnement de l'appareil conformément aux paramètres de conception à la condition que les exigences opérationnelles indiquées dans la documentation du produit soient respectées. La garantie sur chacun des composants est de 12 mois à compter de la date d'expédition.

Zenit s'engage à réparer ou à remplacer le produit dans la mesure où les pannes sont provoquées par des défauts de conception, d'usinage et d'assemblage et que celles-ci sont signalées à Zenit dans la période de garantie.

La garantie ne couvre pas les pannes occasionnées par :

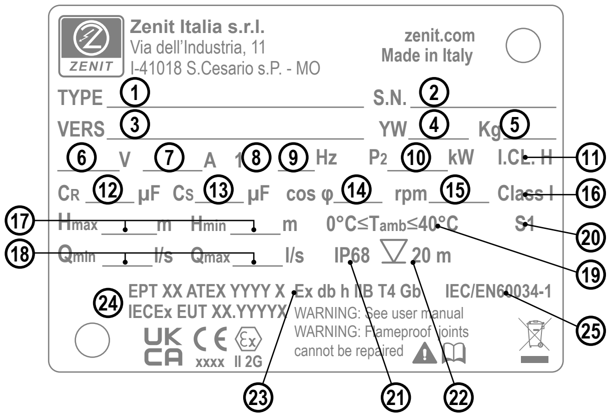
- l'usure normale ;
- des opérations de manutention, d'installation et d'utilisation non conformes ;
- une utilisation avec des systèmes de contrôle qui ne sont pas correctement connectés ;
- des interventions effectuées par un personnel non qualifié ;
- l'utilisation de pièces détachées autres que celles d'origine.

ATTENTION ! **Toute modification apportée au produit sans l'autorisation du fabricant peut comporter un danger, diminuer la performance et annuler la garantie.**

1.12 Plaque signalétique (Fig. 3A, 3B)

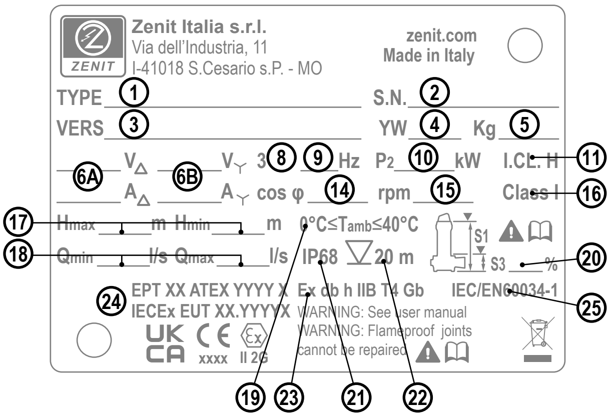
Le couvercle moteur comporte une plaque métallique sur laquelle figurent les données et les certifications de la pompe.
Ce manuel contient un autocollant argenté qui résume les caractéristiques du produit mentionnées sur la plaque métallique fixée à la pompe.
Il est recommandé d'appliquer cet autocollant à l'endroit prévu à cet effet dans le manuel et de consulter ses données pour obtenir les informations nécessaires.

Monophasée


Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
ZENIT
TYPE 1
S.N. 2
VERS 3
YW 4
Kg 5
6 V 7 A 1~ 8 9 Hz P2 10 kW I.Cl. H 11
CR 12 µF CS 13 µF cos φ 14 rpm 15 Class I 16
17 Hmax m Hmin m 0°C≤Tamb≤40°C S1
18 Qmin l/s Qmax l/s IP68 20 m
19
20
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
24 IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
25
23 21 22

3A

Triphasée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Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
ZENIT
TYPE 1
S.N. 2
VERS 3
YW 4
Kg 5
6A V∆ 6B VY 3~ 8 9 Hz P2 10 kW I.Cl. H 11
A∆ AY cos φ 14 rpm 15 Class I 16
17 Hmax m Hmin m 0°C≤Tamb≤40°C S1
18 Qmin l/s Qmax l/s IP68 20 m S3 %
20
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
24 IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
25
19 23 21 22

3B

1. Nom produit
2. Numéro de série
3. Version
4. Année et semaine de construction
5. Poids
6. Tension nominale
6A. Tension et courant *(montage en triangle)*
6B. Tension et courant *(montage en étoile)*
7. Courant nominal
8. Phases
9. Fréquence
10. Puissance du moteur P2
11. Classe d'isolation moteur
12. Condensateur de marche
13. Condensateur de démarrage
14. Facteur de puissance
15. Vitesse *(tr/min)*
16. Classe de protection IEC contre les chocs électriques
17. Hauteur d'élévation minimal et maximale
18. Débit minimal et maximal
19. Température ambiante
20. Service
21. Code IP *(degré de protection carcasse)*
22. Profondeur d'immersion maximale
23. Marquage ATEX et/ou IECEx *(modèles -Ex uniquement)*
24. Numéro de certificat ATEX et IECEx *(modèles -Ex uniquement)*
25. Normes de référence moteur

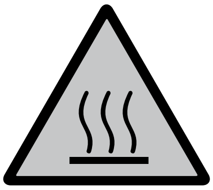
1.13 Signification du marquage -Ex

CE XXXX Marquage CE de conformité à la directive ATEX 2014/34/UE
XXXX indique le numéro de l'organisme notifié (mentionné sur la plaque signalétique) qui a certifié le système de qualité pour ATEX

Marquage -Ex	
Ex II 2G *(ATEX uniquement)*	Ex db h IIB T4 Gb

Symbole	Signification
Ex	Symbole spécifique de protection contre les explosions selon l'annexe. II de la Directive ATEX 2014/34/UE
II	Groupe de l'appareil. Groupe II : appareil électrique destiné à des lieux soumis aux atmosphères explosibles gazeuses autres que les mines.
2G	Catégorie de l'appareil objet de la certification pour atmosphères explosibles dues à la présence de gaz, de vapeurs, de brouillards (G). L'appareil peut être installé en ZONE 1
Ex db h IIB	Le mode de protection électrique utilisé pour l'appareil est une enveloppe antidéflagrante « db » - approprié pour les gaz du groupe IIB et IIA. Le mode de protection mécanique utilisé sur l'appareil est une protection par immersion dans un liquide « k » et par sûreté de construction « C » - approprié pour les gaz du groupe IIB et IIA
T4	Classe de température de l'appareil (température maximale de surface 135°C)
Gb	Appareil avec niveau de protection « élevé » (EPL Gb) - approprié pour une installation en ZONE 1

1.14 Autocollants sur le produit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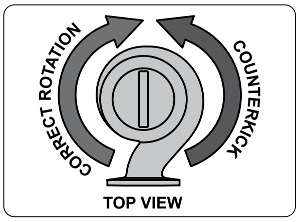

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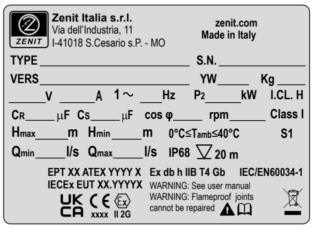
Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ____________ S.N. ____________
VERS ____________ YW _____ Kg _____
_____V _____A 1~ ___Hz P_2_____kW I.CL. H
C_R_____µF C_S_____µF cos φ_____ rpm_____ Class I
H_{max}_____m H_{min}_____m 0°C≤T_{amb}≤40°C S1
Q_{min}_____l/s Q_{max}_____l/s IP68 ▽ 20 m
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX WARNING: See user manual
UK CA CE xxxx II 2G WARNING: Flameproof joints cannot be repaired

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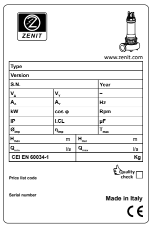

www.zenit.com

Type		
Version		
S.N.		Year
V_Δ	V_Y	~
A_Δ	A_Y	Hz
kW	cos φ	Rpm
IP	I.CL	µF
$Ø_{imp}$	η_{imp}	T_{max}
H_{max} m		H_{min} m
Q_{min} l/s		Q_{max} l/s
CEI EN 60034-1		Kg

Quality check ☐
Price list code
Serial number
Made in Italy
CE

7

Fig. 4 - Autocollant signalétique identifiant les surfaces soumises à un risque de surchauffe
Fig. 5 - Autocollant signalétique identifiant le sens de rotation de la roue (vue supérieure)
Fig. 6 - Autocollant argenté. Reproduit la plaque signalétique du produit et doit être collé dans le manuel à l'endroit prévu à cet effet. Le consulter pour toute information.
Fig. 7 - Autocollant appliqué sur l'emballage du produit

2. TRANSPORT ET STOCKAGE

2.1 Contrôle visuel

Faire un contrôle visuel pour s'assurer que l'emballage n'est pas abîmé. Déballer le produit, puis jeter l'emballage conformément à la réglementation en vigueur. Faire attention à ne pas se blesser avec des outils coupants et à ne pas abîmer le produit, notamment les câbles électriques.
Contrôler le produit pour s'assurer qu'aucune partie n'est abîmée ou manquante. En cas d'articles marquants, contacter Zenit (ou son revendeur) ou encore l'entreprise de transport.
Vérifier que les données figurant sur la plaque signalétique correspondent à celles du produit commandé.

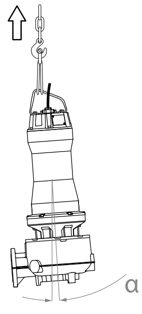
2.2 Manutention et levage

Le levage et la manutention de l'appareil doivent se faire avec une chaîne ou avec une courroie fixée sur la poignée supérieure et à l'aide d'un engin mécanique prévu à cet effet (grue, palan, etc.).
Avant le levage, vérifier le poids de l'appareil mentionné sur la plaque signalétique et utiliser des courroies, des chaînes et des crochets dimensionnés et certifiés.
S'assurer que l'électropompe est bien attachée et qu'elle ne peut pas tomber, rouler ou basculer.
La poignée supérieure a été conçue pour équilibrer l'électropompe pendant le levage. Néanmoins, l'appareil peut basculer au moment où il quitte le sol **(Fig. 8).**
Il est recommandé de ne pas rester à proximité de l'électropompe pendant la manutention.
Toujours porter les équipements de protection individuelle.

ATTENTION ! Avant le levage de la pompe, respecter la réglementation locale relative aux limites de poids des objets en manutention manuelle, c'est-à-dire sans l'utilisation d'un appareil de levage.

ATTENTION ! NE JAMAIS utiliser les câbles électriques d'alimentation ou de signal pour la manutention du produit.

S'assurer que l'atmosphère dans la zone de travail n'est pas explosible. La classification de la zone d'installation doit être définie par son propriétaire.



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2.3 Stockage

Pendant toute la durée de stockage, l'électropompe doit être entreposée dans son emballage dans un lieu approprié, hors de la portée des enfants ou des personnes non responsables. Toutes les précautions doivent être prises contre les chutes accidentelles. L'électropompe doit être protégée contre l'humidité, les vibrations, les poussières et les températures extrêmes (inférieures à -20 °C/-4 °F et supérieures à +60 °C/140 °F).

ATTENTION ! Si l'électropompe est congelée, ne pas utiliser de flammes pour dégeler la glace, mais plonger l'électropompe, jusqu'à décongélation, dans le liquide dans lequel elle sera installée.

Avant d'utiliser le produit, vérifier l'état de l'huile des garnitures mécaniques après une exposition à des températures basses.

ATTENTION ! Tourner la roue de temps à autre (au moins une fois tous les 2 mois) pour éviter que les garnitures mécaniques ne se collent.

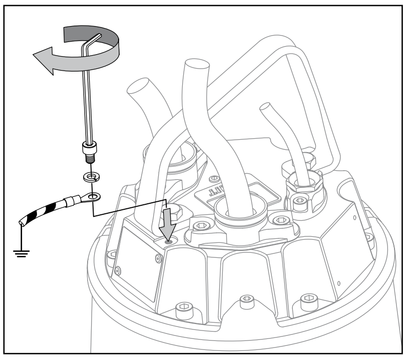
3. INSTALLATION

3.1 Consignes générales de sécurité

- Délimiter correctement le périmètre de travail et porter un équipement de protection individuelle.
- Avant toute intervention, s'assurer que l'électropompe et le tableau électrique ne sont pas sous tension et que toute mise sous tension involontaire est impossible.
- S'assurer que le câble électrique et les garnitures sont en bon état et que la roue tourne librement.
- La cuve où sera installée l'électropompe doit avoir des dimensions qui :
  - permettent aux régulateurs de niveau à flotteur (si présents) de bouger librement ;
  - évitent que le nombre des cycles de marche/arrêt de l'électropompe soit supérieur à celui figurant dans la fiche technique.
- Pour descendre l'électropompe dans la cuve, utiliser une courroie ou une chaîne dimensionnée, fixée au préalable sur la poignée.
- Avant l'installation, contrôler que le fond de la cuve est plat.
- Pour éviter les problèmes de cavitation causés par l'aspiration d'air, s'assurer que l'entrée des liquides dans la cuve ne se fait pas à proximité de l'électropompe ni dans sa direction.
- S'assurer que l'électropompe ne sort pas de sa courbe de fonctionnement.

Ex **S'assurer que l'atmosphère dans la zone de travail n'est pas explosible.
Les personnes ne doivent pas accéder à la zone d'installation quand l'atmosphère est explosive.
La classification de la zone d'installation doit être, dans chaque cas, approuvée par les autorités locales chargées de la sécurité incendie.**

Ex **Les décharges d'origine électrostatique sur les composants isolés peuvent provoquer un risque d'explosion.
Les électropompes -Ex ne possèdent aucune pièce isolée susceptible de se charger électrostatiquement. De plus, elles sont toutes équipées d'une vis de terre pour la liaison équipotentielle (Fig. 9).
Si d'autres accessoires sont installés dans la zone de risque, les mettre à la terre conformément à la norme EN 1127-1.
S'assurer que tous les accessoires supplémentaires installés dans la zone de risque peuvent être utilisés en atmosphères explosibles.**



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Ex **Avant l'installation, contrôler le niveau d'huile dans la chambre des garnitures mécaniques.**

3.2 Contrôle du sens de rotation de la roue

Avant la mise sous tension définitive, un technicien qualifié doit contrôler le sens de rotation de la roue.
L'électropompe présente un autocollant qui précise le sens de rotation de la roue (flèche verte) et le contrecoup de démarrage (flèche rouge), quand l'électropompe est vue depuis le haut **(Fig. 5).**

Ex **Toutes les opérations suivantes doivent être faites dans un lieu sûr, en dehors d'une atmosphère explosible.**

Procéder comme suit :
1. Positionner l'électropompe à la verticale sur son dispositif d'accouplement ou sur son embase.
2. Attacher l'électropompe avec la chaîne ou à la courroie dimensionnée qui est accrochée à la poignée supérieure pour éviter les chutes accidentelles suite à un contrecoup.

ATTENTION ! Le contrecoup peut être très fort. Ne pas rester à proximité de l'électropompe pendant les opérations.

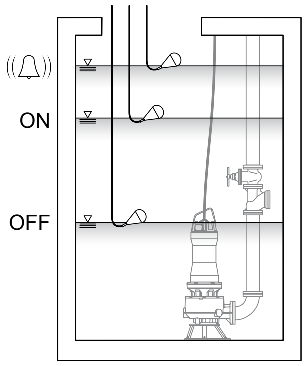
3. Brancher temporairement le conducteur jaune-vert sur la prise de terre du système, puis les fils électriques sur le contacteur.
4. Éloigner les personnes et les objets de l'électropompe à une distance d'au moins 2 mètres.
5. Appuyer sur l'interrupteur de marche pour faire fonctionner l'électropompe pendant quelques secondes, puis appuyer sur l'interrupteur d'arrêt pour l'arrêter.
6. S'assurer que le sens de rotation est correct.

Si le sens de rotation n'est pas correct, inverser deux des trois phases d'alimentation de l'électropompe sur le tableau électrique, puis refaire les opérations décrites pour contrôler une nouvelle fois.
Une fois que le branchement des phases correspond au bon sens de rotation, MARQUER l'ordre exact des fils électriques sur le tableau électrique, DÉBRANCHER les câbles d'alimentation de l'électropompe et procéder à l'installation définitive.

ATTENTION ! Si plusieurs électropompes sont branchées sur le même tableau électrique, contrôler le sens de rotation pour chacune d'entre elles.

3.3 Installation du système de commande par flotteurs

Les flotteurs permettent de piloter la marche et l'arrêt d'une ou de plusieurs électropompes en fonction des hauteurs de liquide dans la cuve.
Ils peuvent aussi être raccordés à des alarmes pour prévenir le fonctionnement dans des conditions anormales (trop-plein ou fonctionnement à sec) **(Fig. 10)**.
Ils doivent être installés à l'écart des tourbillons ou des chutes d'eau.
En cas de fortes turbulences, il est préférable de fixer les flotteurs à une tige rigide positionnée à l'intérieur du puits.
S'assurer qu'aucun objet ne gêne le mouvement des flotteurs et que les câbles ne risquent pas de s'emmêler, de s'entortiller ou de s'encastrer dans les éventuelles saillies présentes à l'intérieur de la cuve.
L'installation des flotteurs doit garantir la hauteur minimum de liquide.



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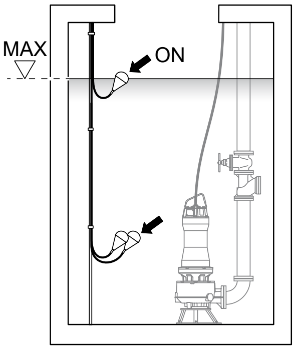
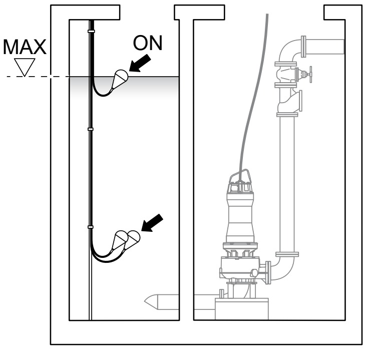
La hauteur minimum de liquide doit être contrôlée par deux flotteurs de niveau (redondants) pour interrompre l'alimentation dès que le liquide atteint la hauteur minimale (pompe entièrement immergée).
Utiliser uniquement des flotteurs de niveau conformes à la classification -Ex du site d'installation.
Le raccordement au tableau électrique doit se faire par une interface à sécurité intrinsèque type les Barrières Zener ou les Barrières à isolement galvanique.

S'assurer que le passage **de l'arrêt à la marche**
se produit uniquement si les flotteurs se trouvent dans la position représentée sur les **Fig 11A, 11B, 11C.**
S'assurer que le passage **de la marche à l'arrêt**
se produit uniquement si les flotteurs se trouvent dans la position représentée sur les **Fig 12A, 12B, 12C.**
Le branchement électrique des flotteurs doit assurer l'arrêt de l'électropompe en cas de dysfonctionnement des flotteurs.

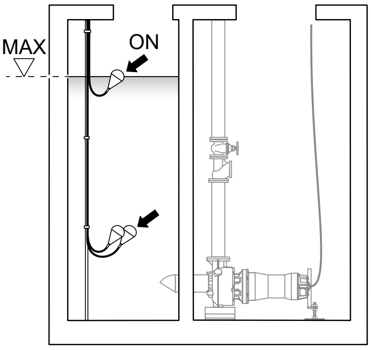
S'assurer que le volume effectif de liquide dans la cuve ne descend pas au point de dépasser le nombre admis de démarrages/heure.



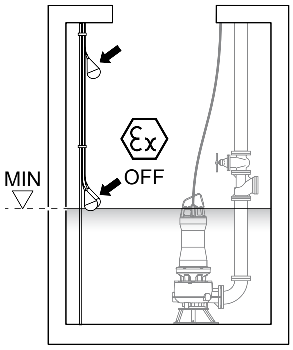
11 A



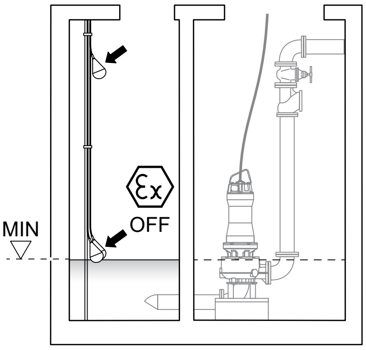
11 B



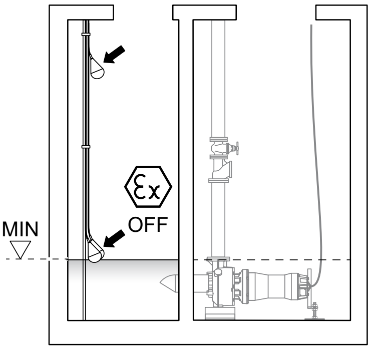
11 C



12 A



12 B



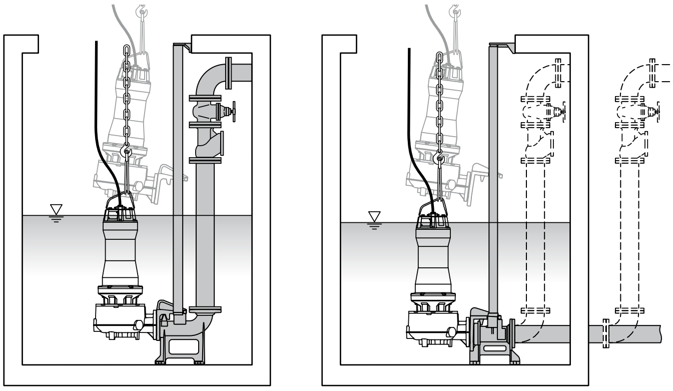
12 C

3.4 Installations autorisées

S'assurer que l'atmosphère dans la zone de travail n'est pas explosible.

3.4.1 Installation avec dispositif d'accouplement DAC

Ce genre d'installation **(Fig. 13)** permet de retirer l'électropompe de la cuve et de la réinstaller rapidement sans intervenir sur le système.



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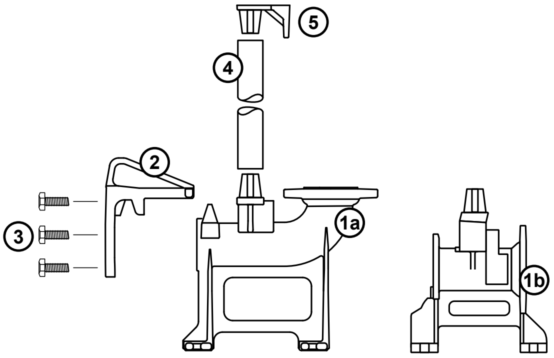
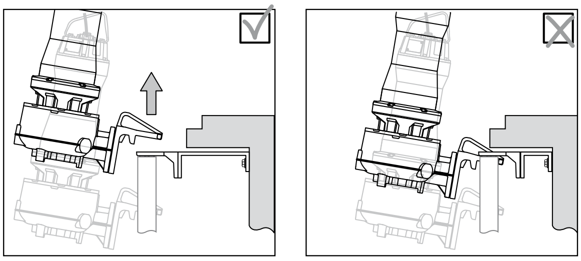


1a.	Dispositif d’accouplement DAC V (refoulement vertical)
1b.	Dispositif d’accouplement DAC H (refoulement horizontal)
2.	Bride d’accouplement
3.	Vis
4.	Barres de guidage (non incluses)
5.	Entretoise

Procédure d'installation (ANNEXE 1 page 130)

1. S'assurer que l'alimentation de l'électropompe est débranchée et que la roue tourne dans le bon sens selon la procédure décrite dans le manuel.
2. Fixer la bride sur l'orifice de refoulement de l'électropompe au moyen des vis fournies. Pour les modèles avec crochet, fixer le crochet au corps de pompe au moyen des vis fournies.
3. Placer le dispositif d'accouplement sur le fond de la cuve et faire un repère pour positionner les trous de fixation.
4. Percer les trous avec un diamètre correspondant aux œillets du dispositif d'accouplement, puis le fixer sur le fond de la cuve avec des chevilles chimiques ou à expansion. Utiliser les vis en acier INOX ou protéger les vis et les écrous avec un produit anticorrosion.
5. Raccorder le tuyau de refoulement au dispositif d'accouplement. Il est recommandé d'installer un robinet-vanne d'arrêt et un clapet anti-retour à bille à passage libre intégral avec un tuyau de raccordement d'une longueur au moins égale à 5 fois le diamètre de l'orifice de refoulement.
6. Accrocher les barres de guidage, découpées sur mesure, sur le dispositif d'accouplement. Utiliser des barres en fer galvanisé ou, de préférence en acier INOX, du bon diamètre (voir la fiche technique).
7. Accrocher l'entretoise sur l'extrémité supérieure des barres de guidage, puis faire un repère pour positionner les trous de fixation sur l'une des cloisons de la cuve. Utiliser un fil à plomb ou un niveau à bulle pour s'assurer que les barres de guidage sont parfaitement verticales.

ATTENTION ! Avant de fixer l'entretoise, vérifier que, si l'électropompe est soulevée, la bride d'accouplement se retire facilement sur les barres de guidage (Fig. 14).



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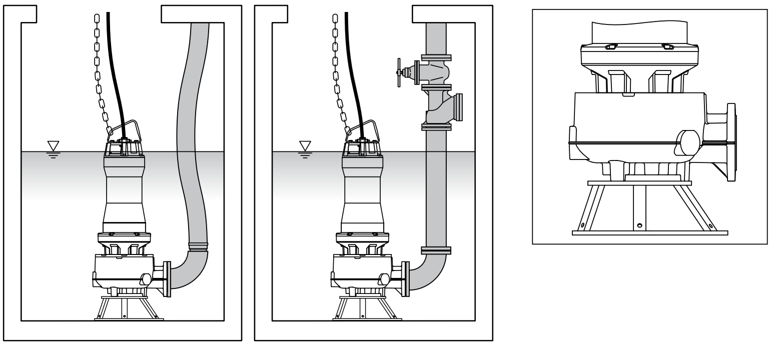
8. Percer les trous avec un diamètre correspondant aux œillets de l'entretoise, puis la fixer avec des chevilles chimiques ou à expansion. Protéger les vis et les écrous avec un produit anticorrosion.
9. Nettoyer la cuve pour éliminer les détritus et les déchets résiduels.
10. Attacher une chaîne ou une courroie dimensionnée sur la poignée, puis descendre l'électropompe dans la cuve en faisant coulisser la bride le long des barres de guidage jusqu'à toucher le dispositif d'accouplement.
11. Fixer les câbles électriques pour prévenir leur torsion, leur déchirement ou leur aspiration par l'électropompe.
12. Faire sortir les câbles électriques de la cuve par une conduite propre et lisse. S'assurer que le câble ne présente pas de courbes trop étroites, et le protéger contre tout écrasement ou endommagement.
13. Raccorder les câbles électriques au tableau électrique.

3.4.2 Installation mobile

Dans le cas de l'installation mobile **(Fig. 15)**, l'électropompe est fixée sur une embase spéciale qui la maintient à la verticale sur le fond de la cuve et place l'orifice d'aspiration à la bonne hauteur.



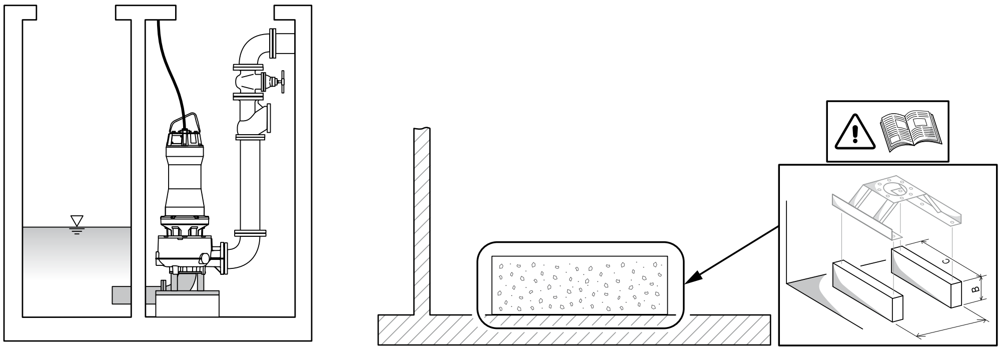
15

Procédure d'installation (ANNEXE 2 page 131)

1. S'assurer que l'alimentation de l'électropompe est débranchée et que la roue tourne dans le bon sens selon la procédure décrite dans le manuel.
2. Attacher une chaîne ou une courroie dimensionnée sur la poignée, puis descendre l'électropompe et la déposer sur l'embase. S'assurer qu'elle ne peut ni tomber ni basculer.
3. Fixer l'électropompe sur son embase avec les vis fournies.
4. Raccorder l'orifice de refoulement à la tuyauterie par le biais de la bride standardisée. Utiliser les vis en acier INOX ou protéger les vis et les écrous avec un produit anticorrosion. Il est recommandé d'installer un robinet-vanne d'arrêt et un clapet anti-retour à bille à passage libre intégral avec un tuyau de raccordement d'une longueur au moins égale à 5 fois le diamètre de l'orifice de refoulement.
5. Si la tuyauterie est flexible, utiliser un embout bridé. Utiliser de préférence un tuyau avec spirale de renfort ou un tuyau semi-rigide pour garantir la continuité du passage libre au niveau des courbes ou des changements de direction. Attacher l'embout sur le tuyau avec un collier métallique.
6. Attacher une chaîne ou une courroie dimensionnée sur la poignée, puis descendre l'électropompe dans la cuve et la déposer sur le fond en position stable. S'assurer que l'électropompe ne peut ni tomber ni basculer.
7. Fixer les câbles électriques pour prévenir leur torsion, leur déchirement ou leur aspiration par l'électropompe.
8. Faire sortir les câbles électriques de la cuve par une conduite propre et lisse. S'assurer que le câble ne présente pas de courbes trop étroites, et le protéger contre tout écrasement ou endommagement.
9. Raccorder les câbles électriques au tableau électrique.

3.4.3 Installation verticale en fosses sèches

Pour l'installation verticale en fosses sèches **(Fig. 16)**, l'électropompe est fournie, sur demande, avec une bride d'aspiration pour fixation sur une embase courbe (KBC).



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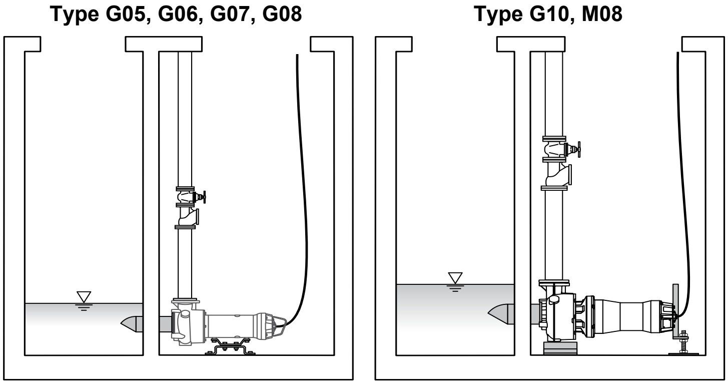
Procédure d'installation (ANNEXE 3 page 132)

1. Sur le fond de la cuve, réaliser deux supports avec un matériau capable de résister au poids et aux contraintes de l'électropompe (ciment, béton, maçonnerie, etc.) pour mettre l'orifice d'aspiration à la bonne hauteur. Consulter la fiche technique pour connaître les dimensions recommandées ;
2. S'assurer que l'électropompe est débranchée du réseau d'alimentation et que la roue tourne dans le bon sens selon la procédure décrite dans le manuel ;
3. Placer l'électropompe sur l'embase et la bloquer avec les vis de fixation ;
4. Raccorder le coude bridé à l'orifice d'aspiration de l'électropompe et bloquer avec les vis de fixation. Le cas échéant, coucher l'électropompe et l'attacher pour prévenir tout mouvement accidentel ;
5. Attacher une chaîne ou une courroie dimensionnée sur la poignée de l'électropompe, puis la descendre dans la cuve et déposer l'embase sur les supports dans le fond de la cuve ;
6. Marquer la position des trous de fixation ;
7. Percer les trous avec un diamètre correspondant aux œillets de l'embase ;

8. Fixer l'embase sur les deux supports avec des chevilles chimiques ou à expansion. Utiliser les vis en acier INOX ou protéger les vis et les écrous avec un produit anticorrosion ;
9. Raccorder le tuyau d'aspiration au coude bridé ;
10. Raccorder le tuyau de refoulement à l'électropompe. Il est recommandé d'installer un robinet-vanne d'arrêt et un clapet anti-retour à bille à passage libre intégral avec un tuyau de raccordement d'une longueur au moins égale à 5 fois le diamètre de l'orifice de refoulement ;
11. Nettoyer la cuve pour éliminer les détritus et les déchets résiduels ;
12. Fixer les câbles électriques pour prévenir leur torsion ou leur déchirement ;
13. Faire sortir les câbles électriques de la cuve par une conduite propre et lisse. S'assurer que le câble ne présente pas de courbes trop étroites, et le protéger contre tout écrasement ou endommagement ;
14. Raccorder les câbles électriques au tableau électrique.

3.4.4 Installation horizontale en fosses sèches

Pour l'installation horizontale **(Fig. 17)**, l'électropompe peut être fixée au support en métal (KBS-H).



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Procédure d'installation (type G05, G06, G07, G08) (ANNEXE 4 page 133)

1. S'assurer que l'alimentation de l'électropompe est débranchée et que la roue tourne dans le bon sens selon la procédure décrite dans le manuel.
2. Fixer l'étrier inférieur au fond de la cuve. Utiliser les vis en acier INOX ou protéger les vis et les écrous avec un produit anticorrosion.
3. Fixer l'étrier supérieur à la pompe.
4. Coucher la pompe en positionnant l'étrier supérieur sur l'étrier inférieur.
5. Visser solidement les étriers.
6. Raccorder les tuyaux d'aspiration et de refoulement. Il est recommandé d'installer un robinet-vanne d'arrêt et un clapet anti-retour à bille à passage libre intégral avec un tuyau de raccordement d'une longueur au moins égale à 5 fois le diamètre de l'orifice de refoulement.
7. Nettoyer la cuve pour éliminer les détritus et les déchets résiduels.
8. Fixer les câbles électriques pour prévenir leur torsion ou leur déchirement.
9. Faire sortir les câbles électriques de la cuve par une conduite propre et lisse. S'assurer que le câble ne présente pas de courbes trop étroites, et le protéger contre tout écrasement ou endommagement.
10. Raccorder les câbles électriques au tableau électrique.

Procédure d'installation (type G10, M08) (ANNEXE 4 page 133)

1. S'assurer que l'alimentation de l'électropompe est débranchée et que la roue tourne dans le bon sens selon la procédure décrite dans le manuel.
2. Placer l'électropompe à la verticale sur une surface lisse et stable.
3. Si présente, dévisser les vis de la poignée de levage puis la retirer. Sinon, dévisser et retirer les anneaux à œil.
4. Fixer l'étrier supérieur au couvercle moteur de l'électropompe. Faire attention à ne pas abîmer les câbles électriques.
5. Fixer l'entretoise à l'étrier supérieur sans serrer les écrous de fixation.
6. Fixer l'étrier inférieur au corps de pompe.
7. Ajuster la position de l'entretoise avec un fil à plomb pour que sa plaque d'appui soit coplanaire avec celle de l'étrier inférieur, puis serrer les écrous de l'entretoise.
8. Positionner l'électropompe à l'aide d'un engin mécanique prévu à cet effet (grue, palan). Pour le levage, utiliser une chaîne ou une courroie dimensionnée en fonction du poids de l'électropompe. Faire attention aux éventuelles oscillations de l'électropompe au moment où elle quitte le sol.
9. Fixer le système sur le fond de la cuve avec des chevilles chimiques ou à expansion. Utiliser les vis en acier INOX ou protéger les vis et les écrous avec un produit anticorrosion.
10. Raccorder les tuyaux d'aspiration et de refoulement. Il est recommandé d'installer un robinet-vanne d'arrêt et un clapet anti-retour à bille à passage libre intégral avec un tuyau de raccordement d'une longueur au moins égale à 5 fois le diamètre de l'orifice de refoulement.
11. Nettoyer la cuve pour éliminer les détritus et les déchets résiduels.
12. Fixer les câbles électriques pour prévenir leur torsion ou leur déchirement.
13. Faire sortir les câbles électriques de la cuve par une conduite propre et lisse. S'assurer que le câble ne présente pas de courbes trop étroites, et le protéger contre tout écrasement ou endommagement.
14. Raccorder les câbles électriques au tableau électrique.

4. BRANCHEMENTS ÉLECTRIQUES

4.1 Consignes générales de sécurité

Tous les branchements électriques doivent être effectués par un personnel qualifié, conformément aux normes en vigueur. Les branchements électriques incorrects peuvent provoquer des incendies, donner lieu à un risque d'électrocution et endommager le produit.

- S'assurer que les conducteurs non utilisés sont correctement isolés et fixés à l'intérieur du tableau électrique.
- Avant l'installation, s'assurer que la tension et la fréquence d'alimentation correspondent à la tension et à la fréquence figurant sur la plaque signalétique, et que la consommation électrique est inférieure au courant maximal de la ligne.
- La variation maximale admissible par rapport à la valeur de tension nominale donnée par la plaque est ± 5 %.
- Déséquilibre de tension admissible entre phases : max. 2 %.
- Les fusibles et les disjoncteurs doivent être dimensionnés en fonction des caractéristiques du système.
- Pour protéger le moteur de l'électropompe, utiliser un discontacteur dimensionné en fonction des caractéristiques électriques figurant sur la plaque signalétique.
- S'assurer que les protections thermiques sont toujours bien raccordées : l'absence de raccordement de la protection thermique annule la garantie et peut constituer un danger.
- La fonctionnalité et la sécurité électrique des électropompes ZENIT sont garanties pour la configuration d'usine : toute modification (p.ex., ajout d'une rallonge au câble d'origine) peut diminuer la performance de l'électropompe.

Avant l'installation et la première mise en service, contrôler que les câbles électriques ne sont pas endommagés pour éviter les courts-circuits.

4.2 Câbles

- Contrôler que les câbles électriques ne sont pas endommagés et que leurs extrémités n'ont pas été exposées à l'humidité ni immergées dans l'eau.
- Les bornes libres du câble doivent être raccordées à un tableau électrique homologué, avec une isolation conforme à l'environnement d'installation.
- Fixer les câbles électriques pour prévenir leur torsion, leur déchirement ou leur écrasement.
- Si le câble est endommagé, ne pas procéder à son remplacement et contacter Zenit ou un centre d'assistance agréé.
- Ne pas sous-estimer les problèmes liés à la chute de tension.

Les bornes libres du câble d'alimentation doivent être raccordées à un tableau électrique certifié pour l'utilisation en atmosphères explosibles en cas d'installation dans une zone de risque.

4.3 Mise à la terre

- Contrôler la présence et l'efficacité de la mise à la terre et du disjoncteur différentiel.
- S'assurer que le conducteur de terre est environ 150 mm plus long que les autres conducteurs, de sorte à être le dernier à se débrancher du tableau électrique en cas d'arrachage accidentel.

Le conducteur de terre externe a une configuration qui admet les câbles avec une section transversale d'au moins 4 mm².

Ne pas raccorder le câble de terre à des canalisations de gaz, d'eau, à des paratonnerres ou à des câbles téléphoniques.
Une mise à la terre incorrecte peut causer un choc électrique.

Sur les modèles -Ex, s'assurer qu'un conducteur de terre externe (jaune/vert, avec section transversale d'au moins 4 mm²) est branché sur la borne de terre externe de la pompe et sécurisé avec un serre-câble.
Nettoyer la surface du conducteur de mise à la terre externe avant de monter le serre-câble.

4.4 Protection thermique

La pompe est équipée de protections thermiques à l'intérieur des enroulements du stator pour arrêter l'alimentation en cas de surchauffe du moteur. La protection thermique standard se compose d'interrupteurs de température à disque bimétallique avec température de commutation nominale NST = 150 °C ; en option, les interrupteurs à disque bimétallique peuvent être remplacés par des thermistances CTP ou par des capteurs PT100. Les câbles de la protection thermique sont identifiés par l'étiquette « TP » = THERMAL PROTECTION (PROTECTION THERMIQUE). Ils doivent être branchés sur les bornes correspondantes du tableau électrique.

Le branchement des protections thermiques sur un tableau électrique est obligatoire. Le tableau électrique doit être configuré pour garantir l'arrêt du moteur lorsque la protection thermique interne se déclenche et pour prévenir le redémarrage automatique de l'électropompe. En effet, le redémarrage doit se faire exclusivement en mode manuel, par un opérateur, après la résolution de la panne.

4.5 Sonde d'humidité

L'électropompe peut être équipée d'une sonde d'humidité à une seule électrode qui détecte et signale les infiltrations d'eau dans la chambre à huile des garnitures mécaniques (le conducteur de terre fait office de retour pour le signal de détection de la présence d'eau dans la chambre à huile).
Si la sonde se déclenche, mettre hors service la pompe et procéder à une intervention de maintenance.
Le câble de signal est identifié par une étiquette avec la lettre **S.**

Pour les installations avec modèles certifiés -Ex, le raccordement au tableau électrique doit impliquer la mise en place, dans la zone sûre, d'une barrière à sécurité intrinsèque avec isolation galvanique.

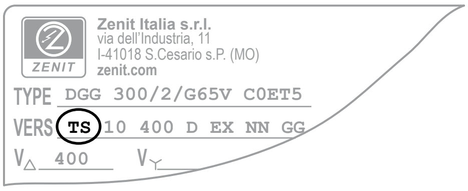
Données électriques sur la sécurité du capteur à sécurité intrinsèque :

Sonde	Ui : 30 V ; Ii : 120 mA ; Pi : 1.3W Ci : 0.3nF ; Li : ~ 0 mH
Câble	Cc : 200pF/m ; Lc : 1µH/m ; Lc/Rc= 30µH/Ω

4.6 Branchement électrique

Pour le branchement électrique de l'électropompe, procéder comme suit :

1. Contrôler la plaque signalétique pour connaître le type de branchement électrique (champ VERS) **(fig. 18)**.
2. Raccorder le conducteur de terre sur la borne correspondante du tableau électrique selon le schéma électrique.
3. Raccorder les câbles d'alimentation sur les bornes correspondantes du tableau électrique selon les schémas électriques.
4. Raccorder les conducteurs des systèmes de commande sur les bornes du tableau électrique.


Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
ZENIT
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⅄

18

N.B. Respecter rigoureusement les branchements indiqués sur les schémas électriques
Consulter la documentation spécifique fournie avec la pompe pour les branchements électriques des capteurs et protections non standards

SCHÉMAS ÉLECTRIQUES PAGE 123

5. MISE EN SERVICE

ATTENTION ! Avant d'effectuer toute intervention, s'assurer que l'électropompe et le tableau électrique ne sont pas sous tension et que toute mise sous tension accidentelle est impossible.

Avant d'activer la pompe, vérifier que :

- il y a de l'huile dans les chambres des garnitures mécaniques (voir paragraphe 6.5.3)
- la roue peut tourner librement
- l'appareil est bien installé et stable
- les dispositifs de contrôle installés sont correctement branchés

5.1 Consignes générales de sécurité

- Toutes les interventions doivent être effectuées par du personnel technique compétent.
- L'électropompe doit toujours être utilisée avec les protections installées et en bon état de fonctionnement.
- Garder les objets et les personnes à une distance de sécurité des appareils installés et empêcher tout contact de personnes ou d'animaux avec le liquide dans lequel ces appareils sont immergés.
- S'assurer que la roue tourne dans le bon sens via la procédure décrite dans le manuel.

5.2 Mise en marche

Les pompes ne doivent pas être mises en marche si l'atmosphère de la cuve est explosible.

Une fois que l'installation est terminée, il convient de tester le fonctionnement du système.
La pompe doit toujours être utilisée avec les protections installées et en bon état de fonctionnement. S'assurer que tous les dispositifs de protection sont branchés correctement.
La pompe ne doit pas fonctionner à sec. Contrôler que le niveau d'huile se situe au-dessus du moteur.
Contrôler que les robinets-vannes (le cas échéant) sont ouverts.
Allumer la pompe et la laisser fonctionner quelques instants pour contrôler que :

- la consommation ne dépasse pas la valeur limite précisée sur la plaque signalétique ;
- les systèmes de monitorage fonctionnent correctement (aucune alarme ou notification) ;
- les niveaux de marche et d'extinction (niveaux minimum et maximum) sont corrects.

ATTENTION ! Le nombre maximum de démarrages/heure doit être respecté pour éviter d'endommager le moteur.

ATTENTION ! En cas de bruits anormaux ou vibrations de la pompe, défauts, alarmes ou alertes, arrêter immédiatement la pompe et ne pas la remettre en marche avant d'avoir trouvé et éliminé la cause des anomalies.

5.3 Niveau de pression acoustique

Le niveau de pression acoustique de l'électropompe, pendant le fonctionnement, est inférieur à 70 dB.
Néanmoins, sur certains systèmes et pour certains points de fonctionnement sur la courbe de performance, cette valeur plafond peut être dépassée. Vérifier le niveau de pression acoustique admissible dans le lieu d'installation pour éviter d'enfreindre les lois locales.

6. MAINTENANCE ET ASSISTANCE

6.1 Introduction

Un entretien régulier et une inspection périodique sont indispensables pour maintenir les performances de la pompe. C'est pourquoi le système doit être nettoyé, entretenu et inspecté à une fréquence régulière.
Si la pompe se comporte différemment des conditions normales de fonctionnement, se reporter au chapitre « 7 ». Résolution des problèmes » de ce manuel et intervenir immédiatement pour corriger l'anomalie.

ATTENTION ! Les instructions relatives au contrôle et à la maintenance de ces pompes ne doivent pas donner lieu à des interventions faites directement par l'utilisateur car elles exigent une connaissance technique spécifique.

REMARQUE : Le contrôle et le remplacement des composants exigent des outils spécifiques.
Pour procéder à ces opérations, contacter le revendeur où le produit a été acheté ou le bureau commercial ZENIT de la région.

Le contrôle et la réparation d'appareils -Ex doivent être effectués conformément à :

- **EN 60079-17 : Atmosphères explosives - Partie 17 : Inspection et entretien des installations électriques**
- **IEC 60034-23 : Machines électriques tournantes - Partie 23 : Réparation, révision et remise en état**
- **EN 60079-19 : Atmosphères explosives - Partie 19 : Réparation, révision et remise en état de l’appareil**

Toutes les interventions sur les électropompes en version -Ex doivent être effectuées par du personnel technique qualifié auprès d’un centre d’assistance certifié -Ex (conformément aux normes internationales et/ou locales) ou par un centre d’assistance Zenit et exclusivement avec des pièces détachées d’origine. L’inobservation de cette obligation entraîne l’annulation de la certification -Ex.

6.2 Consignes générales de sécurité

- Avant toute intervention sur la pompe installée dans des liquides nocifs pour la santé, procéder à un nettoyage complet de la pompe, du réservoir, etc. conformément aux réglementations locales
- Avant les interventions de nettoyage et/ou de maintenance, un technicien compétent doit couper l’alimentation de la pompe pour l’isoler, puis s’assurer que la pompe ne peut pas redémarrer accidentellement.
- Toujours débrancher en premier les conducteurs de phase, puis le conducteur de terre jaune-vert.
- S’assurer que la pompe ne peut ni tomber ni basculer pour éviter tout dommage corporel et matériel.
- Avant toute intervention, laver abondamment la surface de la pompe avec de l’eau claire et/ou avec des détergents spéciaux.
- Après une utilisation prolongée, la surface de la pompe peut devenir très chaude : la laisser refroidir pour prévenir les brûlures.
- Toujours respecter les consignes et normes de sécurité en vigueur dans le lieu d’installation, ainsi que les éventuelles réglementations locales et les règles de bon sens.

6.3 Maintenance programmée et assistance

La fréquence de maintenance dépend du type d’installation, de la charge de travail attribuée à la pompe et de la nature du liquide dans lequel elle est immergée.

Pendant les opérations de maintenance programmée ou dans la mesure où la performance de la pompe a diminué ou les vibrations et le bruit ont augmenté par rapport aux conditions d’origine, contrôler les pièces d’usure. Dans ce cas, contacter un Centre d’assistance agréé.

<table>
<tr><th rowspan="2">Intervalle</th><th colspan="2">Type de vérification</th></tr>
<tr><th>Modèles standard</th><th>Modèle -Ex</th></tr>
<tr><td rowspan="2">Hebdomadaire</td><td colspan="2">Vérifier que la consommation ne dépasse pas la valeur nominale.</td></tr>
<tr><td colspan="2">Vérifier que la tension d'alimentation ne dépasse pas ± 5 % de la valeur nominale.</td></tr>
<tr><td>Mensuelle</td><td colspan="2">Contrôle de la pompe :
Si les performances de la pompe baissent de manière sensible, la roue peut être obstruée ou bloquée par des débris. Enlever les débris et remplacer les pièces endommagées.
Contrôle des câbles : voir paragraphe 6.5.1 « Contrôle des câbles électriques ».
Mesure de la résistance d'isolement : valeur de référence de la résistance d'isolement = min. 20 MΩ
<i>REMARQUE : Le moteur doit être contrôlé si la valeur de la résistance d'isolement est sensiblement inférieure à la valeur mesurée lors du contrôle précédent.</i></td></tr>
<tr><td rowspan="5">Tous les 6 mois ou après 3 000 heures, selon la première éventualité</td><td colspan="2">Contrôle et nettoyage de la chaîne ou de l'élingue de levage :
- Remplacer en cas de dommages, de corrosion ou d'usure
- Éliminer les éventuels corps étrangers</td></tr>
<tr><td colspan="2">Contrôler les treuils, crochets et chaînes s'ils présentent des signes d'usure, de dommages ou de corrosion. Les nettoyer et les lubrifier si nécessaire et remplacer les composants endommagés. Éliminer les éventuels corps étrangers présents.</td></tr>
<tr><td colspan="2">Vérifier que les vis, écrous et boulons sont serrés correctement. Serrer les vis, si nécessaire, et remplacer éventuellement le frein-filet.</td></tr>
<tr><td colspan="2">Vérifier les ancrages au fond de la cuve à chaque fois qu'elle est vidée.</td></tr>
<tr><td></td><td>Contrôler les câbles, l'huile, les garnitures mécaniques, les roulements, les pièces d'usure (roue, bride d'aspiration, etc.).
Si l'huile contient de l'eau, contrôler les garnitures mécaniques. Voir paragraphe 6.5.3 « Procédure de contrôle et de remplacement de l'huile ».
<i>REMARQUE : toujours remplacer les composants en caoutchouc (joints toriques, garnitures) si la pompe doit être démontée pendant le contrôle.</i></td></tr>
<tr><td>Une fois par an</td><td>Contrôler les câbles, l'huile, les garnitures mécaniques, les roulements, les pièces d'usure (roue, bride d'aspiration, etc.).
Si l'huile contient de l'eau, contrôler les garnitures mécaniques. Voir paragraphe 6.5.3 « Procédure de contrôle et de remplacement de l'huile ».
<i>REMARQUE : toujours remplacer les composants en caoutchouc (joints toriques, garnitures) si la pompe doit être démontée pendant le contrôle.</i></td><td></td></tr>
<tr><td rowspan="3">Tous les 2 ans ou après 9 000 heures, selon la première éventualité</td><td colspan="2">Vidange huile.
<i>REMARQUE : Voir le paragraphe « Procédure de contrôle et de remplacement de l'huile » pour plus de détails.</i></td></tr>
<tr><td colspan="2">Remplacement des garnitures mécaniques.
<i>REMARQUE : Le contrôle et le remplacement des garnitures mécaniques exigent des outils spécifiques. Pour effectuer ces opérations, contacter le distributeur où l'équipement a été acheté ou un revendeur dans la région.</i></td></tr>
<tr><td></td><td>Remplacement des roulements</td></tr>
<tr><td>Une fois tous les 2 à 5 ans</td><td colspan="2">Révision :
La pompe doit être révisée même si elle fonctionne correctement. Notamment, une révision pourrait être nécessaire avant ce délai si la pompe fonctionne en service continu.</td></tr>
</table>

6.4 Nettoyage

Éliminer les résidus de la surface de la pompe et la laver à l'eau courante. Si la partie hydraulique est obstruée, la nettoyer soigneusement. Faire particulièrement attention à la partie hydraulique et éliminer tout résidu.
Si la pompe est utilisée pour des applications occasionnelles, après chaque utilisation, il est nécessaire de laver la partie hydraulique pour éviter la formation de dépôts ou d'incrustations. Pour le nettoyage, faire plusieurs cycles de pompage d'eau claire.
Il est préférable de prévenir aussi la formation de dépôts sur les flotteurs pour garantir le respect des valeurs limites de marche/arrêt.

6.5 Contrôles

Vérifier qu'aucun dommage n'est constaté sur la pompe et que les vis, écrous et boulons sont serrées correctement. Serrer les vis au couple de serrage correct (voir paragraphe 6.6), en remplaçant les frein-filets, si nécessaire.

6.5.1 Contrôle des câbles électriques

**Les câbles et conducteurs sont particulièrement susceptibles d'être endommagés. Ils doivent être inspectés à intervalles réguliers, chaque fois que possible.
Vérifier que le câble électrique est intact et ne présente aucun écrasement, coupure ou autre signe d'usure.
Un câble endommagé peut permettre à du liquide de pénétrer dans la pompe et provoquer une fuite électrique, un court-circuit, un choc électrique ou un incendie.
Vérifier que le presse-étoupe est intact.
Les composants endommagés ou défectueux doivent être immédiatement remplacés.**

6.5.2 Contrôle des roulements

Tous les roulements sont à éléments roulants, du type autolubrifié à vie.
Tourner l'arbre à la main pour vérifier la fluidité du mouvement et l'absence de bruits anormaux. Le cas échéant, remplacer les roulements défectueux.

Des roulements défectueux peuvent réduire la sécurité -Ex

6.5.3 Procédure de contrôle et de remplacement de l'huile

Il est nécessaire de remplacer l'huile et de contrôler les garnitures mécaniques si la sonde d'humidité détecte l'infiltration d'eau à l'intérieur de la chambre à huile.
La chambre à huile est configurée de telle sorte que lorsqu'elle est remplie avec la pompe en position verticale, le niveau correct est atteint quand l'huile se situe à l'orifice de remplissage (bouchon huile).

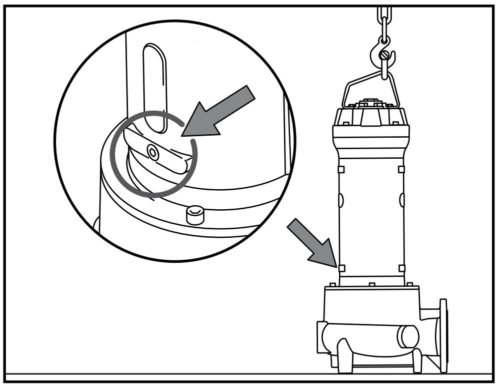
Utiliser de l'huile type TOTAL Bio Hydraulic TMP FR46 ou équivalent avec degré de viscosité ISO (viscosité cinématique à 40°C) 40-90 cSt, point d'éclair ≥ 240°C

Si l'huile mentionnée n'est pas disponible dans le commerce, contacter Zenit.

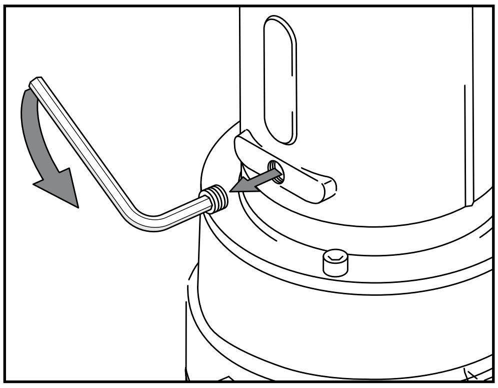
Si les garnitures mécaniques présentent une fuite, un phénomène de surpression peut se produire à l'intérieur de la chambre à huile. Couvrir le bouchon avec un chiffon de taille appropriée, puis le dévisser lentement.

Ne pas évacuer l'huile dans le milieu environnant, mais la remettre à un collecteur d'huiles usagées.

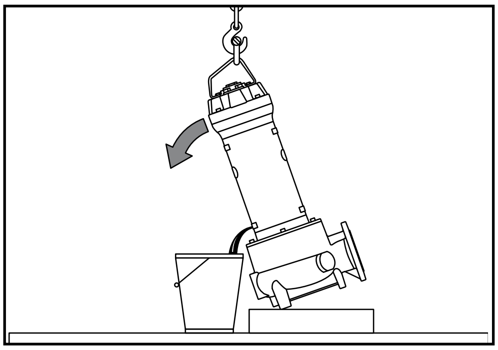
Procédure de changement d'huile
Type de carcasse G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L



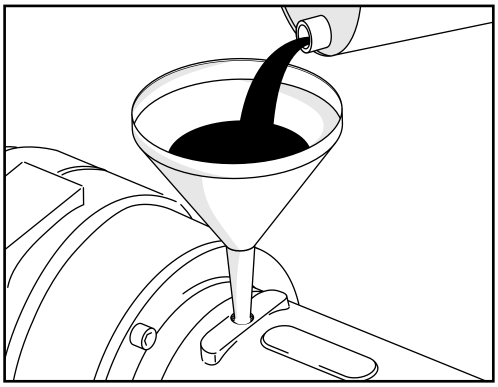
1. Placer l'électropompe sur une surface lisse et stable.
   Utiliser un système de levage approprié et suffisamment dimensionné. La fixer pour l'empêcher de rouler ou de basculer.
2. Repérer les bouchons de la chambre à huile de l'électropompe.



3. Dévisser le bouchon de la chambre à huile.

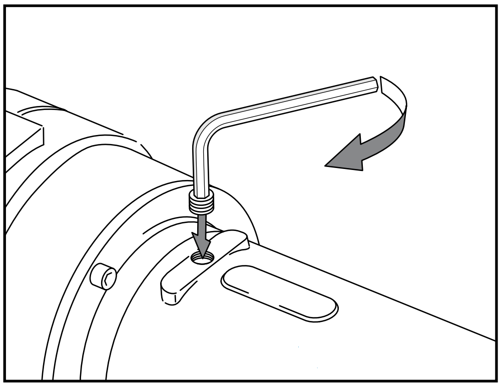


4. Laisser couler l'huile dans un récipient de dimensions appropriées et, si possible, transparent.
5. Placer le récipient contenant l'huile sur une surface horizontale et ne pas le bouger pendant quelques minutes pour permettre à l'eau éventuellement présente de se déposer dans le fond :
   - Huile propre et sans eau : la garniture mécanique est encore en bon état. Verser l'huile neuve.
   - Huile avec un peu d'eau : ce phénomène peut être provoqué par l'ajustement de position des garnitures mécaniques dans les premières heures de fonctionnement. Ce phénomène est donc négligeable.
   - Huile avec eau et impuretés : contrôler et remplacer les garnitures mécaniques. Le remplacement doit être effectué par un Centre d'assistance agréé.



6. Déposer la pompe à l'horizontale sur le plan de travail
7. Remplir la chambre d'huile des garnitures mécaniques avec de l'huile lubrifiante biodégradable.

Type de carcasse	Quantité d'huile chambre des garnitures mécaniques (ml)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

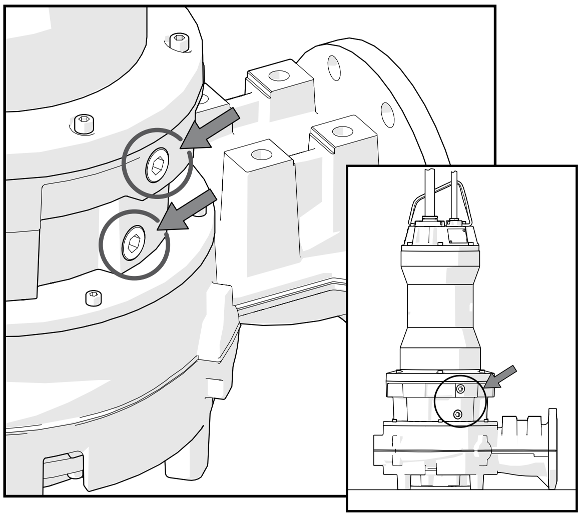


8. Visser le bouchon de la chambre à huile.

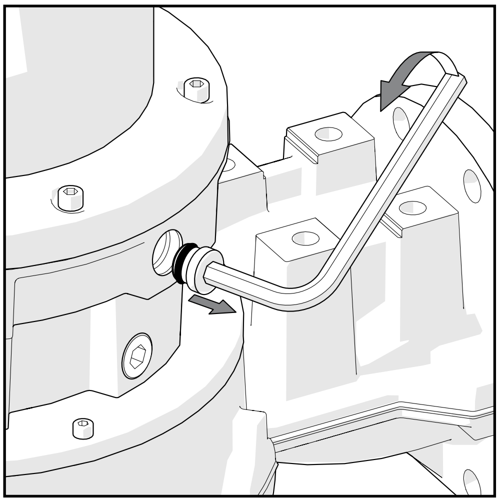
ATTENTION ! **Utiliser un frein-filet type Loctite 243.**

Type de carcasse	Bouchon huile
G05M - G05L G06S - G06L G07S - G07L G08L	1/8" NPT
G10S - G10L	3/8" DIN 906

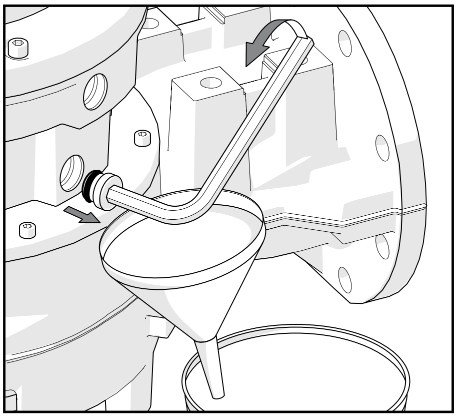
Procédure de changement d'huile Type de carcasse M08S - M08L



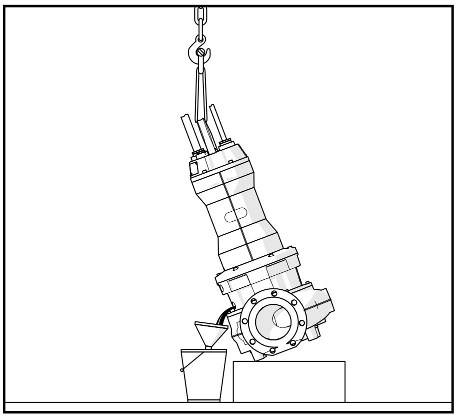
1. Placer l'électropompe sur une surface lisse et stable. Utiliser un système de levage approprié et suffisamment dimensionné. La fixer pour l'empêcher de rouler ou de basculer.
2. Repérer les bouchons de la chambre à huile de l'électropompe.



3. Dévisser le bouchon supérieur de la chambre à huile.

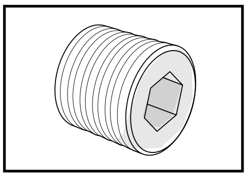


4. Dévisser le bouchon inférieur de la chambre à huile.



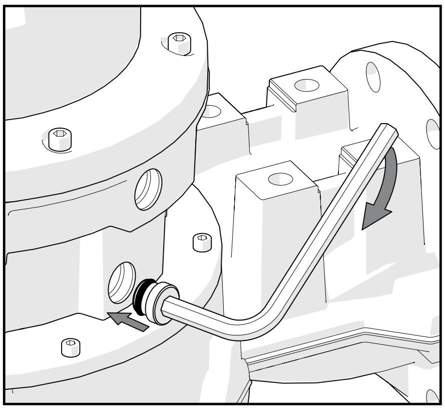
5. Laisser couler l'huile dans un récipient de dimensions appropriées et, si possible, transparent.
REMARQUE : pour s'assurer que le récipient a une capacité suffisante, consulter le tableau pour connaître la quantité d'huile contenue dans la chambre à huile.

6. Placer le récipient contenant l'huile sur une surface horizontale et ne pas le bouger pendant quelques minutes pour permettre à l'eau éventuellement présente de se déposer dans le fond :
   - Huile propre et sans eau : la garniture mécanique est encore en bon état. Verser l'huile neuve.
   - Huile avec un peu d'eau : ce phénomène peut être provoqué par l'ajustement de position des garnitures mécaniques dans les premières heures de fonctionnement. Ce phénomène est donc négligeable.
   - Huile avec eau et impuretés : contrôler et remplacer les garnitures mécaniques. Le remplacement doit être effectué par un Centre d'assistance agréé.

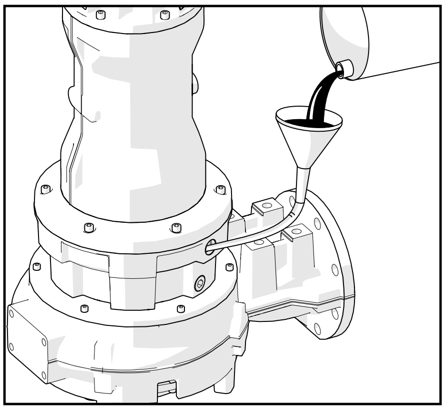


Type de carcasse	Bouchon chambre à huile
M08S - M08L	2x 3/8" DIN 906

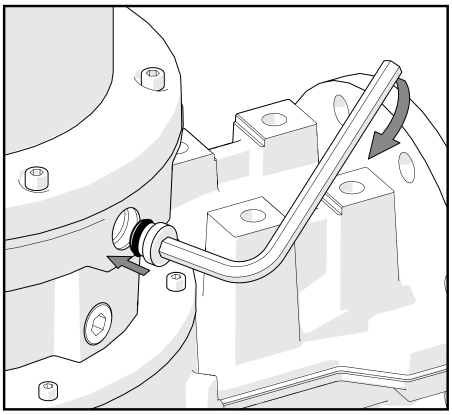
ATTENTION ! **Utiliser un frein-filet type Loctite 243.**



7. Visser le bouchon inférieur de la chambre à huile.



8. Remplir la chambre d'huile des garnitures mécaniques avec de l'huile lubrifiante biodégradable



9. Visser le bouchon supérieur de la chambre à huile.

Type de carcasse	Quantité d'huile chambre garnitures mécaniques (ml)
M08S - M08L	2300

6.6 Vis

En cas de remplacement, utiliser des vis de la classe A2 70, A2 80, A4 70 ou A4 80 selon la norme ISO 3506-1.

Couples de serrage (Nm)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. ÉLIMINATION

Éliminer le produit correctement en séparant les différents composants et en les envoyant à des centres de collecte séparés.
Utiliser un service public ou privé d'élimination des déchets conformément aux réglementations locales en vigueur.

Le symbole de la poubelle barrée, figurant sur l'appareil ou sur l'emballage, signifie qu'en fin de vie utile, le produit doit être collecté et éliminé séparément des autres déchets municipaux non triés.

La bonne exécution de la collecte séparée est une condition préalable pour garantir le recyclage, le traitement et l'élimination compatible avec l'environnement. Cette démarche contribue à prévenir les éventuelles répercussions négatives sur l'environnement et sur la santé et encourage le réemploi et/ou le recyclage des matériaux composant l'appareil.
L'élimination non autorisée du produit par l'utilisateur entraînera l'application des sanctions administratives prévues par la réglementation en vigueur.

8. RÉSOLUTION DES PROBLÈMES

	Problème	Cause possible	Solution
1	La pompe ne démarre pas ou bien elle démarre mais s'arrête aussitôt	Alimentation électrique inadaptée ou insuffisante (p. ex., panne de courant, baisse de tension, etc.)	Contacter un technicien expert
		Câble débranché ou abîmé	Vérifier que le câble est en bon état et que le branchement au réseau est correct
		Défaillance du tableau électrique	Contacter un technicien expert pour identifier la cause de la panne
		Fusibles brûlés	Contrôler le type de fusibles, puis les remplacer par d'autres de valeur appropriée
		Déclenchement du disjoncteur magnétothermique	voir Point 2
		Déclenchement de la protection thermique	voir Point 3
		Alarme sonde d'humidité	voir Point 4
		Déclenchement de l'interrupteur différentiel (RCD)	voir Point 5
		Condensateur abîmé ou mal raccordé (moteur ~1)	Contacter un technicien expert pour le remplacement du condensateur et contrôler qu'il est correctement branché
		Déclenchement du capteur de niveau	Contrôler le raccordement et le fonctionnement du capteur de niveau
2	Déclenchement du disjoncteur magnétothermique	Tension d'alimentation trop basse ou phases non équilibrées.	Contacter un technicien expert
		Branchement électrique incorrect	Contacter un technicien expert pour contrôler et rectifier le branchement électrique
		Relais de surintensité réglé trop bas ou endommagé	Vérifier le relais de surintensité. Régler le relais selon la valeur de courant figurant sur la plaque signalétique
		Enroulement en court-circuit	S'adresser à un centre d'assistance agréé
		Groupe hydraulique obstrué par des corps étrangers	Nettoyer le groupe hydraulique et éliminer l'obstruction
		Rotor bloqué	S'adresser à un centre d'assistance agréé
3	La protection thermique se déclenche peu de temps après la mise en marche	La pompe est immergée dans un liquide trop chaud	Réduire la température du liquide
		Groupe hydraulique obstrué par des corps étrangers	Nettoyer le groupe hydraulique et éliminer l'obstruction
		Pièces internes abîmées	S'adresser à un centre d'assistance agréé
		Tension incorrecte	Vérifier que la tension d'alimentation correspond à la tension figurant sur la plaque signalétique
		Roulements défectueux ou usés	S'adresser à un centre d'assistance agréé
		Nombre excessif de démarrages/heure	voir Point 6
4	Déclenchement de l'interrupteur différentiel (RCD)	Humidité dans le moteur	S'adresser à un centre d'assistance agréé
		Isolation du moteur basse	S'adresser à un centre d'assistance agréé
		Câble abîmé	Vérifier que le câble d'alimentation est en bon état. Le cas échéant, s'adresser à un centre d'assistance pour son remplacement

5	La pompe fonctionne, mais le débit est faible ou nul	Groupe hydraulique obstrué par des corps étrangers	Nettoyer le groupe hydraulique et éliminer l'obstruction
		Tuyau de refoulement obstrué par des corps étrangers	Nettoyer le tuyau de refoulement
		Clapet anti-retour bloqué	Nettoyer les clapets anti-retour
		Robinet-vanne partiellement fermé ou bloqué	Ouvrir et, le cas échéant, nettoyer le robinet-vanne
		La roue tourne dans le mauvais sens	Contrôler le sens de rotation et inverser les branchements électriques pour deux des trois phases
		Fuites dans l'installation	Contrôler l'installation et éliminer la cause des fuites
		Mauvais choix de pompe	Remplacer la pompe par une pompe appropriée
6	Nombre excessif de démarrages/heure	Réglage incorrect des capteurs de niveau	Corriger le réglage des capteurs de niveau
		Dysfonctionnement des capteurs de niveau	Vérifier le fonctionnement des capteurs
		Turbulences à proximité des capteurs de niveau	Éliminer les causes de turbulence ou modifier la position des capteurs de niveau
		Puits trop petit	Modifier les dimensions du puits
7	Présence de vibrations ou bruit excessif	Pièces internes abîmées	S'adresser à un centre d'assistance agréé
		Roulements défectueux ou usés	S'adresser à un centre d'assistance agréé
		Roue obstruée, déséquilibrée ou abîmée	S'adresser à un centre d'assistance agréé
		Roue bloquée	Nettoyer la roue et éliminer l'obstruction
		La roue tourne dans le mauvais sens	Contrôler le sens de la rotation et inverser les branchements électriques pour deux des trois phases
		Phase manquante	Contacter un technicien expert
		Oscillations de l'installation	Contrôler l'installation
8	La pompe fonctionne, mais la consommation est excessive	Point de fonctionnement incorrect	Contrôler que la pompe fonctionne dans sa plage de fonctionnement
		Tension d'alimentation incorrecte	Restaurer la bonne tension d'alimentation à la valeur indiquée sur la plaque signalétique
		Groupe hydraulique obstrué par des corps étrangers	Nettoyer le groupe hydraulique et éliminer l'obstruction
		Roulements défectueux ou usés	S'adresser à un centre d'assistance agréé
		La roue tourne dans le mauvais sens	Contrôler le sens de la rotation et inverser les branchements électriques pour deux des trois phases
		Enroulement du stator abîmé	S'adresser à un centre d'assistance agréé
9	Détection d'infiltrations	Infiltration d'eau dans le moteur suite à la détérioration des câbles, joints toriques ou presse-étoupes	S'adresser à un centre d'assistance agréé
		Infiltration d'eau dans la chambre à huile suite à l'usure ou à la détérioration des garnitures mécaniques ou des joints toriques	

Pour des réparations ou d'autres demandes, les informations suivantes sur le produit sont requises :

Modèle	**Numéro de série**	**Date d'achat**

Notes :

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Die Betriebsanleitung ist zur Gewährleistung der ordnungsgemäßen Installation und des sicheren Betriebs des Geräts durchzulesen. Sie ist an einem leicht zugänglichen geschützten Ort sorgfältig und jederzeit einsehbar aufzubewahren.
Die zweckwidrige Verwendung des Produkts kann Betriebsstörungen sowie schwerwiegende Personen- und Sachschäden zur Folge haben und den Verfall der Garantie bewirken.

1. ALLGEMEINE INFORMATIONEN

1.1 Angaben zum Hersteller

ZENIT Italia S.r.l. - via dell’Industria, 11 - 41018 S.Cesario sul Panaro (Modena) - Italien

1.2 Symbolik

Achtung - Gefährdung von Bediener und Elektromotorpumpe

Achtung - Gefährdung durch elektrische Spannung

Achtung - Verbrennungsgefahr durch heiße Oberflächen

Ex Achtung - Anweisungen, die Modelle mit Ex-Schutz-Zertifizierung betreffen.
Bei Nichtbeachtung dieser Anweisungen besteht Explosionsgefahr.
Diese Anweisungen sollten auch hinsichtlich der Standardmodelle berücksichtigt werden.

ACHTUNG! Wichtige, besonders zu beachtende Information

1.3 Allgemeine Sicherheitshinweise

- Das Gerät darf nicht von Personen verwendet werden, die nicht über die hierfür erforderlichen Fachkenntnisse und/oder Erfahrung verfügen; zudem ist es außerhalb der Reichweite von Kindern zu halten.
- Die Installation muss von kompetentem technischem Personal ausgeführt werden, das in der Lage ist, den Inhalt der Betriebsanleitung zu verstehen. Das für die Installation und Instandhaltung des Produkts zuständige Personal ist über die Restrisiken zu unterrichten, die mit dem Betrieb von elektrischen Geräten verbunden sind.
- Sicherstellen, dass Personen nicht unbeabsichtigt in den Behälter oder in das Becken fallen können; gegebenenfalls einen Deckel oder ein Schutzgeländer installieren.
- Das Gerät muss während seines Handlings, seiner Installation oder seines Ausbaus von der Stromversorgung getrennt sein.
- Innerhalb des Arbeitsbereichs unbedingt auf die Risiken in Verbindung mit Gasen und Dämpfen achten.
- Auf keinen Fall Komponenten oder dergleichen des Geräts herunterschlucken oder einatmen.
- Personen und Tiere dürfen auf keinen Fall in die Flüssigkeit eintauchen oder damit in Kontakt kommen, solange die Elektromotorpumpe nicht aus dem Becken oder Behälter entnommen wurde.
- Das freie Ende des Netzkabels darf nicht in Kontakt mit Flüssigkeiten kommen.
- Die elektrische Anlage muss mit einem wirkungsvollen Erdungsanschluss ausgestattet sein.
- Vor dem Anschluss der Stromversorgung sicherstellen, dass das Gerät korrekt installiert wurde und ein geeigneter Sicherheitsabstand eingenommen wird.
- Das Gerät ausschließlich zu den Zwecken verwenden, für die es konzipiert und konstruiert wurde, da der Hersteller nicht für Schäden an Personen oder Gegenständen haftet, die auf den unsachgemäßen, von den Vorgaben in der Betriebsanleitung abweichenden Gebrauch des Geräts oder auf die Missachtung der Wartungs- und Sicherheitsvorschriften zurückzuführen sind; vor der Installation in chemisch aggressiven Bereichen den Hersteller kontaktieren, um die Kompatibilität der Materialien zu prüfen.
- Auf keinen Fall Änderungen an der Elektromotorpumpe oder an deren Teilen (Anschlüsse, Bohrungen, Finishs usw.) ausführen.
- Der Anwender bzw. Nutzer muss die im Land der Nutzung geltenden Sicherheitsvorschriften berücksichtigen, die Regeln des gesunden Menschenverstands beachten und zudem sicherstellen, dass die periodisch anfallenden Reinigungs- und Wartungsarbeiten korrekt ausgeführt werden.
- Der Installateur ist dazu verpflichtet, die Betriebsumgebungsbedingungen auf ihre Eignung zu überprüfen, um Sicherheit und Hygiene zu garantieren.
- Die Verantwortlichkeiten des für den Gebrauch des Produkts berechtigten Personals übernimmt der Kunde.

1.4 Qualifizierung des Installations- und Instandhaltungspersonals

Das für die Installation und Instandhaltung des Produkts zuständige Personal ist über die unvermeidbaren Risiken zu unterrichten, welche mit dem Betrieb von elektrischen Geräten verbunden sind, die in Kontakt mit biologischen Flüssigkeiten arbeiten.
Außerdem muss es imstande sein, den Inhalt der dem Produkt beigefügten technischen Unterlagen und insbesondere der Anschlusspläne zu lesen und zu verstehen.

1.5 Vorgeschriebene persönliche Schutzausrüstung (PSA)

Bei der Handhabung der Elektromotorpumpe die vorschriftsmäßige persönliche Schutzausrüstung tragen bzw. verwenden.
Der Gebrauch bzw. das Tragen von Schutzhandschuhen, Sicherheitsschuhen, Schutzbrille mit Seitenschutz und Lederschürze ist Vorschrift.
Vor der Handhabung des bereits installierten Produkts ist es gründlich mit laufendem Wasser und/oder Reinigungsmitteln zu reinigen.

1.6 Restrisiken

Das Produkt ist so konzipiert und gebaut, dass ein sicherer und zuverlässiger Betrieb gewährleistet ist.
Dieses Produkt ist für die Verwendung mit gesundheitsgefährdenden Medien bestimmt. Daher muss das für die Installation und Instandhaltung zuständige Personal stets mit größter Vorsicht vorgehen und die vorschriftsmäßige persönliche Schutzausrüstung verwenden.
Bei Arbeiten an der Elektromotorpumpe ist ihr Herunterfallen zu verhindern. Die Verbrennungs-, Stromschlag- und Ertrinkungsgefahr sowie die Erstickungs- oder Vergiftungsgefahr durch Einatmen von giftigen Gasen darf nicht unterschätzt werden.

Ex **Um die Gefahr durch Blitzschlag zu verringern, muss der Betreiber etwaige geeignete Blitzschutzmaßnahmen treffen.**

Ex-Schutz-Verbindungsstücke dürfen nicht repariert werden.
In explosionsfähiger Atmosphäre das Gerät auf keinen Fall öffnen.

Die Elektromotorpumpe muss während ihres Handlings, ihrer Installation oder ihres Ausbaus vom Schaltschrank getrennt sein.

1.7 Beschreibung des Produkts / Zweckbestimmung

Diese Produkte sind für den Einsatz in privaten, industriellen und kommunalen Klär- und Hebeanlagen bestimmt.
Sie eignen sich zum Heben und Fördern von Schlämmen, Gülle, sauberem Wasser und Abwasser mit Fest- oder Faseranteilen.

Sie dürfen weder zum Fördern von Flüssigkeiten für Lebensmittelzwecke verwendet noch in explosionsfähiger Atmosphäre eingesetzt werden (explosionsgeschützte Modelle sind davon ausgenommen).

Die Tauchmotorpumpen Serie Grey dürfen niemals für die Förderung von explosiven, entzündlichen oder brennbaren Flüssigkeiten verwendet werden.
Die Ex-Schutz-Modelle sind gemäß der Kennungs-Zeichenfolge auf dem Typenschild für den Gebrauch in explosionsfähiger Atmosphäre zertifiziert (siehe Abschnitt 1.12)

Diese Elektromotorpumpe muss an einer Halterung befestigt oder in einem speziellen Raum installiert werden. Sie ist nicht dafür ausgelegt, während des Gebrauchs in der Hand / den Händen gehalten zu werden.
Die Motoren der Pumpen Grey werden immer von ZENIT bereitgestellt und sind mit einem biegsamen Kabel für die Stromversorgung, die Steuerung und die Überwachungskreise ausgestattet. Die Kabeldurchführung gewährleistet Dichtheit und Reißfestigkeit und somit eine sichere Installation. Zusätzliche Elemente im Lieferumfang des Geräts sind nicht erforderlich. Für den Anschluss an die Anlage, für den Schaltschrank und für deren Eignung hinsichtlich der Eigenschaften des Geräts ist der Kunde zuständig.

Die Tauchmotorpumpen der Serie Grey werden nach Hydrauliktyp eingeordnet.

- Modelle DGG: Tauchmotorpumpen mit zurückgesetztem Freistrom-Laufrad und großem Kugeldurchgang
  Anwendungsbereiche: nicht rechengereinigtes Schwarzwasser und Kanalisationsabwasser in kommunalen und industriellen Hebeanlagen, Abwasseraufbereitungsanlagen und in der Tierhaltung.
- Modelle DRG: Tauchmotorpumpen mit Kanallaufrad
  Anwendungsbereiche: Industrieabwasser und Prozessabwasser, kommunale Hebestationen, Entwässerung und Heben aus Schmutzfangzellen.
- Modelle GRG: Tauchmotorpumpen mit Mehrkanallaufrad und Zerkleinerungssystem
  Anwendungsbereiche: Heben von Flüssigkeiten mit faserigen oder langfaserigen Bestandteilen in gewerblichen und industriellen Anwendungen sowie in der Tierhaltung
- Modelle APG: Tauchmotorpumpen mit Mehrkanallaufrad mit großer Förderhöhe
  Anwendungsbereiche: Klarwasser und sandhaltiges Wasser, Niederschlagswasser und Sickerwasser

1.7.1 Modellkennzeichnung

Die Pumpe kann über die Felder TYPE und VERS auf dem Typenschild identifiziert werden. Siehe Abschnitt 1.12

Typ

DG G 300/2/ G 65 V C 0 E T 5
(A) (B) (C)
① ② ③ ④ ⑤⑥⑦⑧⑨

① Laufradtyp
DG = Freistromlaufrad
DR = Kanallaufrad
GR = Schneidwerk
AP = Große Förderhöhe
② Serie
G = Grey

③ Leistung (PSx100) / Polzahl Motor
④ Druckstutzen
(A) TYP (Rohrgewinde/Flansch)
(B) DURCHMESSER (mm)
(C) POSITION
V = Vertikal H = Horizontal

⑤ Hydraulische Variante
⑥ Hydraulische Version
⑦ Motorgröße
⑧ Motorausführung
M = Einphasenmotor
T = Drehstrommotor
⑨ Frequenz
5 = 50 Hz 6 = 60 Hz

Version

TS 10 400 D EX NN GG
⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Elektrische Variante
⑪ Kabellänge (m)
⑫ Nennspannung

⑬ Anlauf
D = DOL (direkt)
Y = Stern-Dreieck
⑭ Zertifizierung
NN = Standard
EX = ATEX, ATEX + IECEx
CX = IECEX

⑮ Personalisierungen
⑯ Werkstoff Laufrad

1.8 Technische Daten

Die Eigenschaften und die technischen Daten des Produkts sind im Datenblatt aufgeführt.
In der nachstehenden Tabelle sind die Gehäusetypen je nach Größe des Motors angegeben.

EINPHASIGE Version

Typ	Beschreibung _ ②③_⑦⑧_	P2 (kW)/ Polzahl
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

DREHSTROM-Version

Typ	Beschreibung _ ②③_⑦⑧_	P2 (kW)/ Polzahl
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

DREHSTROM-Version

Typ	Beschreibung _ ②③_⑦⑧_	P2 (kW)/ Polzahl
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

1.9 Betriebsbedingungen

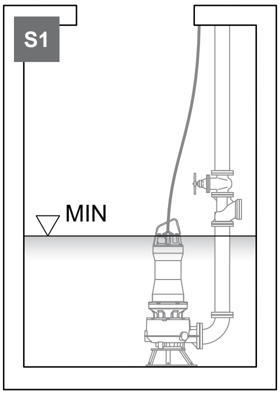
Für die Pumpe gelten folgende Betriebsbedingungen:

- Fördermediums-/Umgebungstemperatur: 0 ÷ 40°C
- pH-Wert: 6 ÷ 14
- Betriebsart: Einphasige Modelle: S1 - Pumpe vollständig eingetaucht **(Abb. 1)**
  Dreiphasige Modelle: S1 - Pumpe vollständig eingetaucht **(Abb. 1)**
  S3 - Pumpengehäuse vollständig eingetaucht oder geflutet **(Abb. 2A, 2B, 2C)** gemäß Wert S3% auf dem Typenschild, mit Angabe in **Tabelle 1**
- Anläufe/Stunde: max. 20 bei Motorleistung P2 bis 10 kW, max. 15 bei Motorleistung P2 über 10 kW

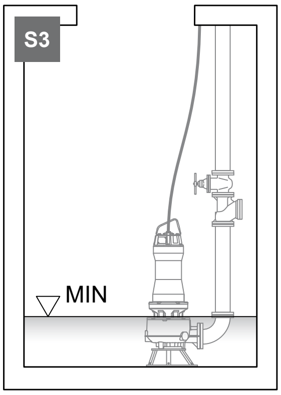
1.10 Sonderbedingungen

Die Elektromotorpumpe kann nur bei vollständigem Eintauchen im Dauerbetrieb (S1) arbeiten.
Bei Trockeninstallation muss das Gerät im periodischen Aussetzbetrieb (S3) arbeiten.
Für den Betrieb müssen mindestens zwei Niveausensoren (redundant) vorgesehen werden, die das Gerät bei Unterschreitung des Mindeststands des Fördermediums spannungsfrei schalten:
S1 - Pumpe vollständig eingetaucht **(Abb. 1)**
S3 - Pumpengehäuse vollständig eingetaucht oder geflutet **(Abb. 2A, 2B, 2C)**

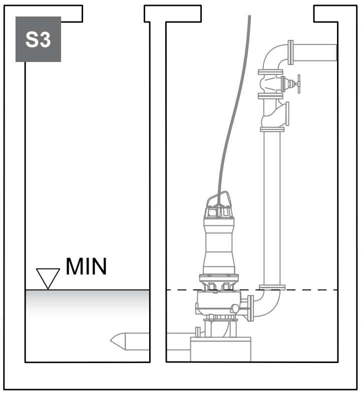
ACHTUNG! Stets sicherstellen, dass die Pumpe immer mit dem vorgesehenen Mindeststand des Fördermediums arbeitet (siehe Abschnitt 3.3)Es sollte stets geprüft werden, dass die Elektromotorpumpe bei Mindeststand des Fördermediums ordnungsgemäß funktioniert. Bestimmte Installationen können weitere Maßnahmen erfordern, um die Wirbelbildung und folglich den saugseitigen Lufteintritt in die Elektromotorpumpe zu unterbinden.



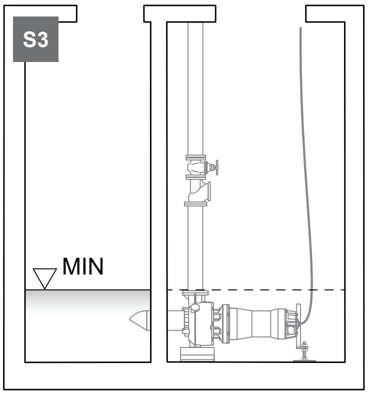
1



2A



2B



2C

In der Statorwicklung des Geräts ist serienmäßig eine thermische Schutzvorrichtung eingerichtet, die bei Überhitzung des Motors die Stromversorgung unterbricht (siehe Abschnitt 4.4)

Ex **Der Betreiber ist verpflichtet, die thermischen Schutzvorrichtungen an eine Schalteinheit mit Ausrückgerät anzuschließen, deren Einstellung den automatischen Wiederanlauf des Geräts verhindert.**

Ex **Betrieb mit Frequenzumrichter: Die thermischen Schutzvorrichtungen sind vorschriftsgemäß im Schaltschrank anzuschließen, um bei Überhitzung des Motors die Stromversorgung zu unterbrechen.**

Die Pumpen Grey sind mit einem Wasser-im-Öl-Sensor ausgestattet, der das Vorhandensein von Wasser innerhalb der Ölkammer (Raum der Gleitringdichtungen) erfasst.

Ex **Der Wasser-im-Öl-Sensor ist vorschriftsgemäß nach den Anweisungen im Abschnitt 4.5 anzuschließen.**

Ex **Schrauben, Kleinteile und Verankerungen müssen nach den Vorgaben der Norm EN ISO 3506-1 in Klasse A2-70, A2-A80, A4-70 oder A4-80 ausgeführt sein.**

Ex **Die Pumpe in der Ex-Schutz-Version kann in der Betriebsart S3 gemäß Wert S3% auf dem Typenschild arbeiten; siehe Angaben in nachstehender Tabelle:**

Tabelle 1: Betriebsart S3 für Modelle in Ex-Schutz-Version

Typ Gehäuse	Beschreibung _ ②③_⑦⑧_	P2 (kW)/ Polzahl	Betriebsart
G05M	_G 75/2_AT_	0.55/2	50%
	_G 100/2_AT_	0.75/2	50%
G05L	_G 150/2_AT_	1.1/2	30%
	_G 200/2_AT_	1.5/2	30%
	_G 250/2_AT_	1.8/2	20%
	_G 100/4_AT_	0.75/4	15%
	_G 150/4_AT_	1.1/4	15%
	_G 200/4_AT_	1.5/4	15%
G06S	_G 300/2_ET_	2.2/2	20%
	_G 200/4_ET_	1.5/4	20%
G06L	_G 400/2_ET_	3/2	20%
	_G 250/4_ET_	1.8/4	20%
	_G 300/4_ET_	2.2/4	20%
	_G 400/4_ET_	3/4	15%
G07S	_G 550/2_FT_	4/2	20%
	_G 750/2_FT_	5.5/2	15%
G07L	_G 1000/2_FT_	7.5/2	10%
	_G 550/4_FT_	4/4	15%
	_G 750/4_FT_	5.5/4	15%

Typ Gehäuse	Beschreibung _ ②③_⑦⑧_	P2 (kW)/ Polzahl	Betriebsart
G08L	_G 1200/2_GT_	9/2	15%
	_G 1500/2_GT_	11/2	15%
	_G 1750/2_GT_	13/2	10%
	_G 1000/4_GT_	7.5/4	15%
G10S	_G 2000/2_HT_	15/2	10%
	_G 1200/4_HT_	9/4	15%
	_G 1500/4_HT_	11/4	10%
	_G 1000/6_HT_	7.5/6	10%
G10L	_G 2500/2_HT_	18.5/2	15%
	_G 2000/4_HT_	15/4	15%
	_G 1200/6_HT_	9/6	15%
	_G 1500/6_HT_	11/6	15%
	_G 1750/6_HT_	13/6	15%
M08S	_G 400/6_GT_	3/6	20%
M08L	_G 550/6_GT_	4/6	20%
	_G 750/6_GT_	5.5/6	20%

1.11 Gewährleistung

ZENIT garantiert für den Betrieb des Geräts gemäß den Planungsparametern unter der Bedingung, dass die in den Unterlagen des Produkts aufgeführten Anforderungen für den Betrieb berücksichtigt werden. Die Garantiezeit für die einzelnen Komponenten beträgt 12 Monate ab dem Datum der Lieferung.
Zenit verpflichtet sich zur Reparatur oder zum Austausch des Produkts im Falle von Mängeln, die auf Konstruktions-, Verarbeitungs- oder Montagefehler zurückzuführen sind und Zenit innerhalb des Gewährleistungszeitraums angezeigt werden.
Von der Gewährleistung ausgeschlossen sind Schäden infolge der nachstehenden Ursachen:

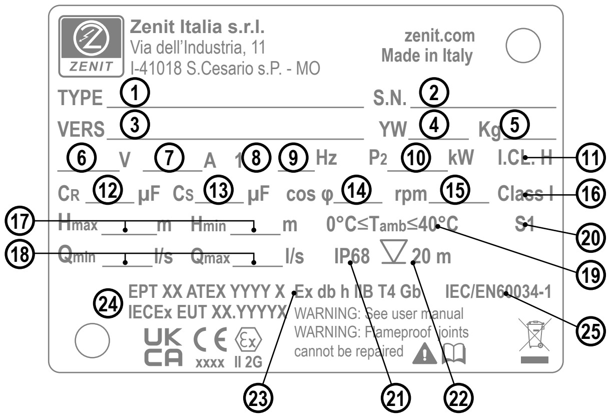
- normaler Verschleiß;
- unsachgemäße Handhabung, Montage und Verwendung;
- Betrieb mit Hilfe von nicht ordnungsgemäß angeschlossenen Steuersystemen;
- Eingriffe durch nicht qualifiziertes Personal;
- Verwendung von Nicht-Originalersatzteilen.

ACHTUNG! Jede Änderung am Produkt, die ohne Genehmigung des Herstellers vorgenommen wird, kann Gefahrensituationen, die Beeinträchtigung der Leistungsmerkmale und den Verlust der Gewährleistungsansprüche zur Folge haben.

1.12 Typenschild (Abb. 3A, 3B)

Auf dem Motordeckel ist ein Metallschild angebracht, auf dem die Betriebsdaten und die Zertifizierungen der Pumpe aufgeführt sind.
Dieser Betriebsanleitung ist ein silberfarbenes Klebeetikett beigelegt, das die Produktdaten angibt, die sich auf dem an der Pumpe befestigten Metallschild befinden. Das Etikett in den hierfür vorgesehenen Bereich in der Betriebsanleitung einkleben. Bei etwaigen Anfragen oder Informationen sind die darin angegebenen Daten zu nennen.

Einphasig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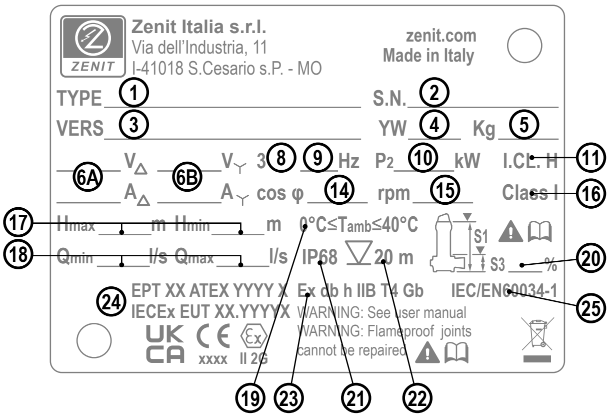
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
⑥ V ⑦ A 1 ⑧ ⑨ Hz
P2 ⑩ kW
I.Cl. H ⑪
CR ⑫ μF CS ⑬ μF
cos φ ⑭
rpm ⑮
Class I ⑯
⑰ Hmax m Hmin m
0°C≤Tamb≤40°C ⑲
S1 ⑳
⑱ Qmin l/s Qmax l/s
IP68 ㉑
20 m ㉒
㉔ EPT XX ATEX YYYY X
IECEx EUT XX.YYYYX
Ex db h IIB T4 Gb ㉓
IEC/EN60034-1 ㉕
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA
CE
xxxx II 2G

3A

Dreiphasig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I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
⑥A V△ A△
⑥B V⋎ A⋎
3 ⑧ ⑨ Hz
P2 ⑩ kW
I.Cl. H ⑪
cos φ ⑭
rpm ⑮
Class I ⑯
⑰ Hmax m Hmin m
0°C≤Tamb≤40°C ⑲
S1
S3 %
⑳
⑱ Qmin l/s Qmax l/s
IP68 ㉑
20 m ㉒
㉔ EPT XX ATEX YYYY X
IECEx EUT XX.YYYYX
Ex db h IIB T4 Gb ㉓
IEC/EN60034-1 ㉕
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA
CE
xxxx II 2G

3B

1. Produktname
2. Seriennummer
3. Version
4. Baujahr und -woche
5. Gewicht
6. Nennspannung
6A. Spannung und Stromstärke *(Dreieckschaltung)*
6B. Spannung und Stromstärke *(Sternschaltung)*
7. Nennstrom
8. Phasen
9. Frequenz
10. Motorleistung P2
11. Isolierstoffklasse des Motors
12. Betriebskondensator
13. Anlaufkondensator
14. Leistungsfaktor
15. Drehzahl *(U/min)*
16. Schutzklasse gemäß IEC gegen Stromschlag
17. Minimale und maximale Förderhöhe
18. Minimale und maximale Förderleistung
19. Umgebungstemperatur
20. Betriebsart
21. IP-Code *(Gehäuseschutz)*
22. Maximale Eintauchtiefe
23. Kennungs-Zeichenfolge ATEX und/oder IECEx *(nur Ex-Schutz-Modelle)*
24. Zertifikatnummer ATEX und IECEx *(nur Ex-Schutz-Modelle)*
25. Bezugsnormen für den Motor

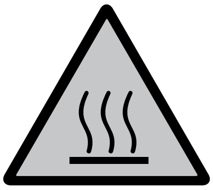
1.13 Bedeutung der Ex-Kennzeichnung

CE XXXX	CE-Kennzeichnung in Übereinstimmung mit der Richtlinie ATEX 2014/34/EU XXXX ist die Kennnummer der notifizierten Stelle (Angabe auf dem Typenschild), die das Qualitätssystem für ATEX zertifiziert hat

Ex Kennungs-Zeichenfolge	
Ex II 2G *(nur ATEX)*	Ex db h IIB T4 Gb

Symbol	Bedeutung
Ex	Spezielles Explosionsschutzkennzeichen gemäß Anhang II der ATEX-Richtlinie 2014/34/EU
II	Gerätegruppe. Gruppe II: elektrisches Gerät zur Verwendung in Bereichen außer im Bergbau, in denen eine explosionsfähige Atmosphäre durch Gase auftritt.
2G	Gerätekategorie des zertifizierten Geräts für Bereiche, in denen eine explosionsfähige Atmosphäre, bestehend aus einem Gemisch von Luft und Gasen, Dämpfen oder Nebeln (G), vorhanden ist. Das Gerät darf in ZONE 1 installiert werden
Ex db h IIB	Zündschutzart für elektrische Geräte entspricht der Ausführung des Gerätegehäuses mit druckfester Kapselung „db" – geeignet für Gase der Gruppe IIB und IIA. Zündschutzart für nicht-elektrische Geräte entspricht der Ausführung des Gerätegehäuses mit Flüssigkeitskapselung „k" und konstruktiver Sicherheit „c" - geeignet für Gase der Gruppe IIB und IIA.
T4	Temperaturklasse des Geräts (max. Oberflächentemperatur 135°C)
Gb	Gerät mit „hohem" Schutzniveau (EPL Gb), geeignet für den Einsatz in ZONE 1

1.14 Klebeetiketten am Produkt



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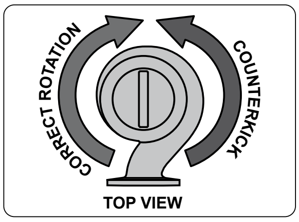

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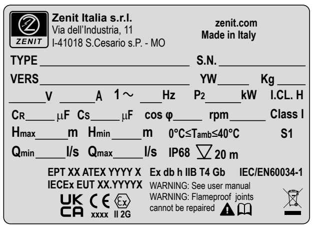

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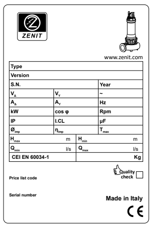
Made in Italy

TYPE__________ S.N.__________
VERS__________ YW_____ Kg_____
_____V _____A 1～ ____Hz P_2_____kW I.CL. H
C_R_____μF C_S_____μF cos φ_____ rpm_____ Class I
H_{max}_____m H_{min}_____m 0°C≤T_{amb}≤40°C S1
Q_{min}_____l/s Q_{max}_____l/s IP68 ▽ 20 m
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX WARNING: See user manual
UK CA CE xxxx II 2G WARNING: Flameproof joints cannot be repaired

6



7

Abb. 4 - Markenetikett zur Warnung vor heißer Oberfläche
Abb. 5 - Markenetikett mit Angabe der richtigen Drehrichtung des Laufrads (von oben gesehen)
Abb. 6 - Silberfarbenes Etikett. Reproduktion des am Produkt angebrachten Typenschilds. Ist in den hierfür vorgesehenen Bereich in der vorliegenden Anleitung einzukleben. Die auf dem Etikett ausgewiesenen Daten sind bei allen Informationsanfragen und sonstigen Anfragen anzugeben.
Abb. 7 - Etikett an der Produktverpackung

2. TRANSPORT UND LAGERUNG

2.1 Sichtkontrolle

Per Sichtkontrolle prüfen, ob die Verpackung unbeschädigt ist. Verpackungsmaterial entfernen und vorschriftsmäßig entsorgen. Bei der Verwendung von Schneidwerkzeugen darauf achten, weder sich selbst zu verletzten noch das Produkt, insbesondere die Stromkabel, zu beschädigen.
Produkt auf beschädigte oder fehlende Teile kontrollieren. Fehlen Teile, die Firma Zenit (oder ihren Händler) oder das Transportunternehmen kontaktieren.
Sicherstellen, dass die auf dem Typenschild angegebenen Daten mit denen des bestellten Produkts übereinstimmen.

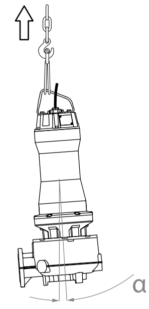
2.2 Heben und Transport

Das Gerät ist mit einem geeigneten Hebezeug (Kran, Flaschenzug usw.) zu heben und zu transportieren. Hierzu ist eine Kette oder Rundschlinge am oberen Griff anzuschlagen.
Vor dem Heben das auf dem Typenschild des Produkts angegebene Gewicht prüfen und nur geprüfte und entsprechend dimensionierte Rundschlingen, Ketten und Haken verwenden.
Sicherstellen, dass die Elektromotorpumpe sicher angeschlagen ist und nicht herabfallen, wegrollen oder ins Schwingen geraten kann.
Der obere Griff ist so konzipiert, dass sich die Elektromotorpumpe beim Anheben im Gleichgewicht befindet. Dennoch besteht die Möglichkeit, dass sie ins Schwingen gerät, wenn sie sich vom Boden löst **(Abb. 8).**
Während des Hebens und Transports ist der Aufenthalt in der Nähe der Elektromotorpumpe verboten.
Stets die vorgeschriebene persönliche Schutzausrüstung tragen.

ACHTUNG! Vor dem Heben der Pumpe sind die örtlichen Vorschriften in Bezug auf die Gewichtsobergrenzen beim manuellen Handling von Gegenständen, d.h. ohne Verwendung von Hebegeräten oder -zeugen, zu beachten.

ACHTUNG! Das Produkt NIEMALS an seinen Strom- oder Signalkabeln anheben.

Sicherstellen, dass im Arbeitsbereich keine explosionsfähige Atmosphäre vorhanden ist. Der Installationsort ist durch den Eigentümer zu klassifizieren.



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2.3 Lagerung

Die Elektromotorpumpe muss in ihrer Verpackung an einem geeigneten Ort außerhalb der Reichweite von Kindern und gefährdeten Personen gelagert werden. Sie ist gegen Herabfallen, Feuchtigkeit, Vibrationen, Staub und extreme Temperaturen (unter -20°C/-4°F und über +60°C/140°F) zu schützen.

ACHTUNG! Sollte die Elektromotorpumpe eingefroren sein, darf sie nicht mit einer Flamme vom Eis befreit werden. Man muss sie stattdessen zum Auftauen in die Flüssigkeit eintauchen, in die sie installiert werden soll.

Vor der Verwendung des Produkts den Zustand des Öls der Gleichringdichtungen kontrollieren, falls es tiefen Temperaturen ausgesetzt war.

ACHTUNG! Gelegentlich (mindestens einmal alle 2 Monate) das Laufrad drehen, um zu verhindern, dass die Gleitringdichtungen aneinander haften bleiben.

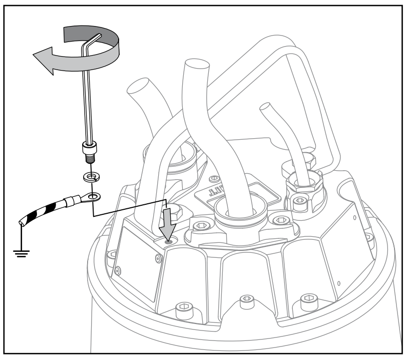
3. INSTALLATION

3.1 Allgemeine Sicherheitshinweise

- Den Arbeitsbereich entsprechend abgrenzen und persönliche Schutzausrüstung tragen.
- Vor Ausführung jeglicher Tätigkeit sicherstellen, dass die Elektromotorpumpe und der Schaltschrank vom Stromnetz getrennt sind und nicht unbeabsichtigt eingeschaltet werden können.
- Sicherstellen, dass Stromkabel und Dichtungen nicht beschädigt sind und das Laufrad ungehindert drehen kann.
- Die Abmessungen des Beckens, in dem die Elektromotorpumpe installiert wird, sollen Folgendes gewährleisten:
  - Schwimmerschalter der Niveausteuerung (sofern vorhanden) können sich ungehindert bewegen;
  - Anzahl der Ein-/Ausschaltzyklen der Elektromotorpumpe überschreitet nicht den im technischen Datenblatt angegebenen Höchstwert.
- Die Elektromotorpumpe ist mit Hilfe einer angemessen dimensionierten Rundschlinge oder Kette, die am Griff angeschlagen ist, in das Becken herabzulassen.
- Vor dem Einbau prüfen, ob der Beckenboden eben ist.
- Zur Vermeidung von Kavitationsproblemen aufgrund von Luftansaugung ist sicherzustellen, dass der Flüssigkeitseintritt in das Becken weder in der Nähe der Elektromotorpumpe noch in ihre Richtung erfolgt.
- Sicherstellen, dass die Elektromotorpumpe nicht außerhalb ihrer Kennlinie arbeitet.

Sicherstellen, dass im Arbeitsbereich keine explosionsfähige Atmosphäre vorhanden ist. Bei Vorhandensein von explosionsfähiger Atmosphäre ist der Zutritt von Personen in den Installationsbereich untersagt.
Der Installationsort ist von Fall zu Fall durch die örtliche Brandschutzbehörde zu klassifizieren.

Die elektrostatische Entladung isolierter Komponenten kann Explosionen verursachen. Elektromotorpumpen mit Ex-Schutz haben keine isolierten Komponenten, die sich elektrostatisch aufladen können, und sind sämtlich mit einer Schraube für den Anschluss an die Erdungsschiene für den Potentialausgleich versehen (Abb. 9).
Etwaige zusätzliche Komponenten, die im explosionsgefährdeten Bereich installiert werden, müssen ebenfalls gemäß Norm EN 1127-1 mit dem Erdungsnetz verbunden werden. Bei jeder im explosionsgefährdeten Bereich zu montierenden zusätzlichen Komponente sicherstellen, dass sie für den Betrieb in einer explosionsfähigen Atmosphäre zugelassen ist.



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Vor der Installation den Ölstand in der Kammer der Gleitringdichtungen kontrollieren.

3.2 Kontrolle der Drehrichtung des Laufrads

Bevor der endgültige Anschluss ans Stromnetz vorgenommen wird, muss eine Fachkraft die Drehrichtung des Laufrads kontrollieren.
An der Elektromotorpumpe ist ein Aufkleber mit Angabe der vorgeschriebenen Drehrichtung des Laufrads (grüner Pfeil) und der Rückstoßrichtung (roter Pfeil) bei von oben betrachteter Elektromotorpumpe angebracht **(Abb. 5).**

Alle nachstehend beschriebenen Arbeiten sind an einem sicheren Ort auszuführen, an dem keine explosionsfähige Atmosphäre vorhanden ist.

Verfahrensweise:
1. Die Elektromotorpumpe senkrecht auf ihren Stützfüßen oder ihrem Sockel aufstellen.
2. Die Elektromotorpumpe mit einer Kette oder einem Seil mit geeigneter Tragfähigkeit, die bzw. das am oberen Griff anzuschlagen ist, sichern, um zu verhindern, dass sie infolge des Rückstoßes umfällt.

ACHTUNG! **Der Rückstoß kann sehr stark sein. Während dieses Vorgangs sich nicht in der Nähe der Elektromotorpumpe aufhalten.**

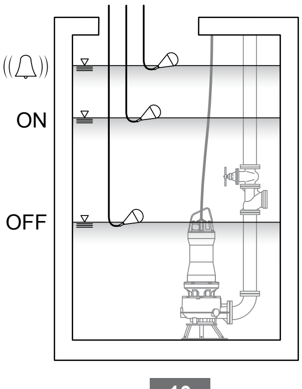
3. Den grün-gelben Leiter provisorisch an die Erdungsbuchse der Anlage anschließen und anschließend die Phasenleiter an den Fernschalter anschließen.
4. Personen und Gegenstände müssen sich in einem Sicherheitsabstand von mindestens 2 m zur Elektromotorpumpe befinden.
5. Den Start-Schalter betätigen, um die Elektromotorpumpe kurzzeitig mit Strom zu versorgen, und dann den Stopp-Schalter betätigen, um die Stromversorgung wieder zu unterbrechen.
6. Prüfen, ob die Drehrichtung korrekt ist.

Bei falscher Drehrichtung sind im Schaltschrank zwei der drei Phasenleiter der Elektromotorpumpe zu vertauschen. Dann die Drehrichtung erneut wie oben kontrollieren.
Die der korrekten Drehrichtung entsprechende Phasenfolge am Schaltschrank KENNZEICHNEN. Die Phasenleiter der Elektromotorpumpe wieder ABKLEMMEN und dann die endgültige Installation vornehmen.

ACHTUNG! **Werden mehrere Elektromotorpumpen an denselben Schaltschrank angeschlossen, ist die Drehrichtung jeder Pumpe einzeln zu kontrollieren.**

3.3 Installation der Füllstandsüberwachung mit Schwimmerschaltern

Die Schwimmerschalter gestatten die kontrollierte Ein- und Ausschaltung von einer oder mehreren Elektromotorpumpen in Abhängigkeit vom Flüssigkeitsstand im Becken.
Außerdem können Alarmeinrichtungen angeschlossen werden, um anormale Bedingungen (Überlauf oder Trockenlauf) zu unterbinden **(Abb. 10)**.
Die Schwimmerschalter sind entfernt von Wirbeln und von oben einströmendem Wasser zu installieren.
Bei Vorliegen von starken Turbulenzen ist es ratsam, die Schwimmerschalter an einer im Schacht angeordneten starren Stange zu befestigen.
Sicherstellen, dass die Bewegung der Schwimmerschalter nicht durch Gegenstände behindert wird und dass sich ihre Kabel nicht ineinander verschlingen, verdrehen oder an Vorsprüngen im Becken verfangen können.
Die Schwimmerschalter sind so zu installieren, dass der richtige Mindestfüllstand der Flüssigkeit gewährleistet ist.



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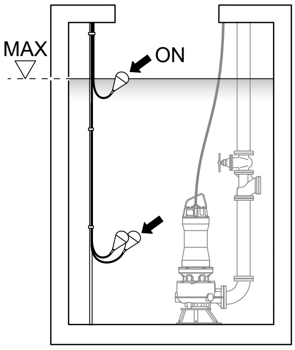
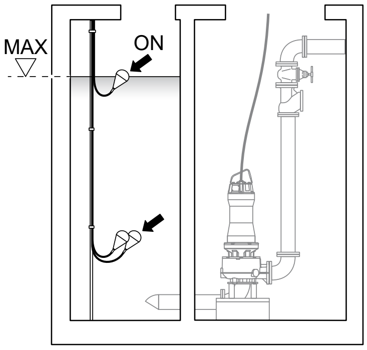
Der minimale Flüssigkeitsstand soll stets von zwei Schwimmerschaltern (redundant) überwacht werden. Ihre Ausschaltschwelle soll dem Mindeststand der Flüssigkeit (Pumpe vollständig eingetaucht) entsprechen.
Nur Schwimmerschalter verwenden, die für die Ex-Schutz-Einstufung des Installationsortes geeignet sind.
Der Anschluss an den Schaltschrank hat über eine Sicherheitsbarriere vom Typ Zenerbarriere oder eine galvanische Trennung zu erfolgen.

Sicherstellen, dass die Umschaltung **von Aus auf Ein**
ausschließlich dann erfolgt, wenn sich Schwimmerschalter in der in **Abb. 11A, 11B, 11C** dargestellten Position befinden.
Sicherstellen, dass die Umschaltung **von Ein auf Aus**
ausschließlich dann erfolgt, wenn sich Schwimmerschalter in der in **Abb. 12A, 12B, 12C** dargestellten Position befinden.
Der elektrische Anschluss der Schwimmerschalter ist so auszuführen, dass die Pumpe im Falle einer Fehlfunktion der Schwimmerschalter garantiert abgeschaltet wird.

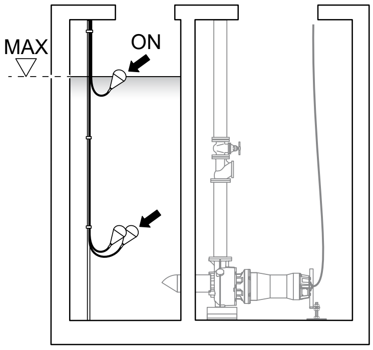
Sicherstellen, dass der tatsächliche Füllstand im Becken nicht so stark sinkt, dass die Anlaufzahl pro Stunde den zulässigen Höchstwert überschreitet.



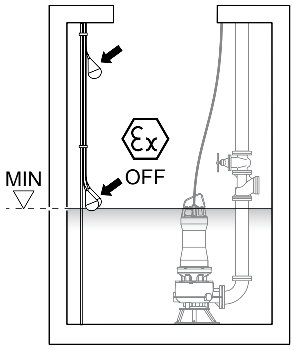
11 A



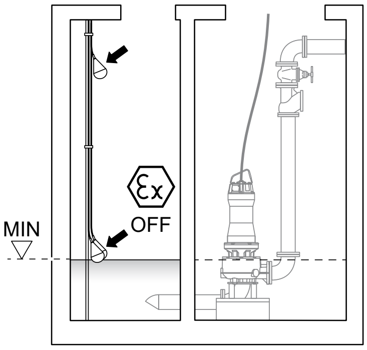
11 B



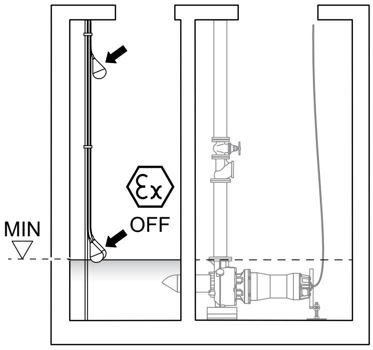
11 C



12 A



12 B



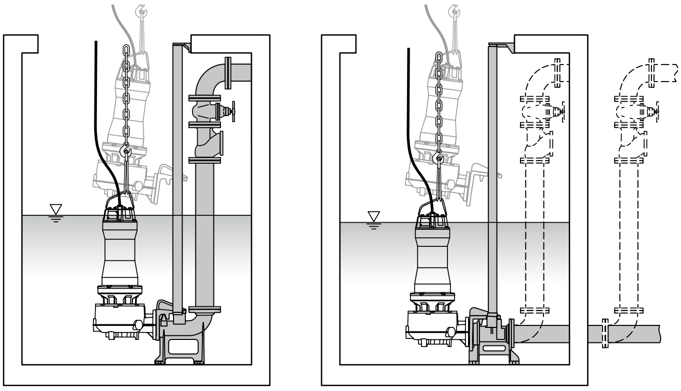
12 C

3.4 Zulässige Installationstypen

Sicherstellen, dass im Arbeitsbereich keine explosionsfähige Atmosphäre vorhanden ist.

3.4.1 Installation mit Kupplungsvorrichtung DAC

Diese Installationsart **(Abb. 13)** ermöglicht den schnellen Aus- und Einbau der Elektromotorpumpe aus dem bzw. in das Becken, ohne dass Eingriffe an der Anlage erforderlich sind.



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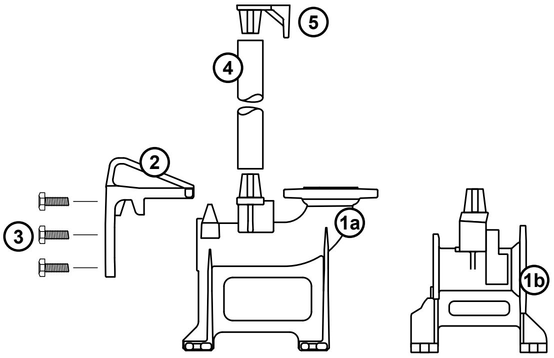
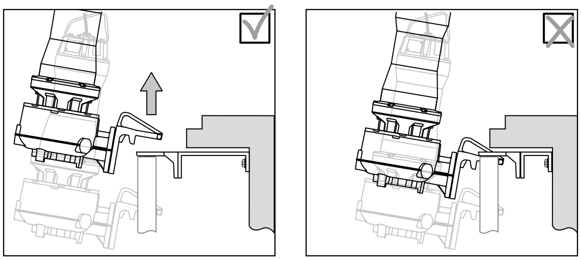


1a. Kupplungsvorrichtung DAC V (vertikaler Druckstutzen)
1b. Kupplungsvorrichtung DAC H (horizontaler Druckstutzen)
2. Kupplungsflansch
3. Schrauben
4. Führungsrohre (nicht im Lieferumfang enthalten)
5. Abstandsbügel

Installationsverfahren (ANHANG 1, S. 130)

1. Nachdem die Drehrichtung des Laufrads gemäß dem in der Betriebsanleitung beschriebenen Verfahren kontrolliert wurde, sicherstellen, dass die Elektromotorpumpe vom Stromnetz getrennt ist.
2. Den Flansch unter Verwendung der mitgelieferten Schrauben am Druckstutzen der Elektromotorpumpe befestigen. Bei den Modellen mit Haken den Haken mittels der mitgelieferten Schrauben am Pumpengehäuse befestigen.
3. Die Kupplungsvorrichtung auf den Boden des Beckens stellen und die Position der Befestigungsbohrungen markieren.
4. Die Bohrungen mit einem Durchmesser ausführen, der für die Langlöcher zur Befestigung der Kupplungsvorrichtung geeignet ist. Dann die Kupplungsvorrichtung mit Verbundankern oder Spreizdübeln stabil am Beckenboden befestigen. Entweder Edelstahlschrauben verwenden oder die Schrauben und Muttern mit einem geeigneten Produkt gegen Korrosion schützen.
5. Die Druckleitung an die Kupplungsvorrichtung anschließen. Es müssen ein Absperrschieber und ein Kugelrückschlagventil mit freiem Kugeldurchgang installiert werden; hierzu ein Verbindungsrohr verwenden, dessen Länge mindestens dem 5-fachen Durchmesser des Druckstutzens entspricht.
6. Die auf Maß abgelängten Führungsrohre an der Kupplungsvorrichtung anbringen. Hierzu sind Rohre aus verzinktem Eisen oder, vorzugsweise, aus Edelstahl mit geeignetem Durchmesser verwendbar (siehe Datenblatt).
7. Den Abstandsbügel auf das obere Ende der Führungsrohre stecken und die Position der Bohrungen für seine Befestigung an einer der Beckenwände markieren. Mit einem Senklot oder einer Wasserwaage sicherstellen, dass die Führungsrohre genau senkrecht stehen.

ACHTUNG! Vor dem Befestigen des Abstandsbügels sicherstellen, dass der Kupplungsflansch beim Anheben der Elektromotorpumpe vollständig von den Führungsrohren abgezogen werden kann (Abb. 14).



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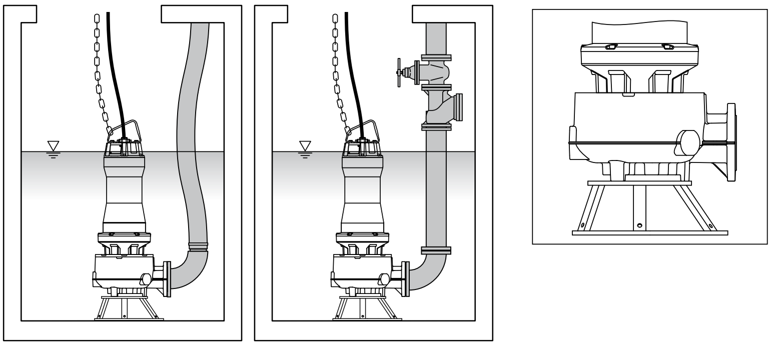
8. Befestigungslöcher für den Abstandsbügel bohren. Der Lochdurchmesser soll für die Befestigung des Abstandsbügels geeignet sein. Den Bügel mit Hilfe von Verbundankern oder Spreizdübeln stabil befestigen. Schrauben und Muttern mit einem geeigneten Korrosionsschutzmittel schützen.
9. Das Becken von Schutt und Abfällen säubern.
10. Eine angemessen dimensionierte Kette oder Rundschlinge an den Griff anschlagen. Die Elektromotorpumpe in das Becken herablassen. Hierbei soll der Flansch die Führungsrohre entlang gleiten, bis er auf der Kupplungsvorrichtung aufsitzt.
11. Die Stromkabel so sichern, dass sie nicht verdrehen, reißen oder von der Elektromotorpumpe eingesaugt werden können.
12. Die Stromkabel durch einen sauberen Kanal mit glatten Wänden aus dem Becken führen. Darauf achten, dass die Kabel nicht geknickt, gequetscht oder anderweitig beschädigt werden.
13. Die Stromkabel im Schaltschrank anschließen.

3.4.2 Mobile Installation

Bei der mobilen Installation **(Abb. 15)** wird die Elektromotorpumpe an einem Sockel befestigt, der sie in der vertikalen Position am Beckenboden hält und die richtige Höhe des Saugstutzens garantiert.



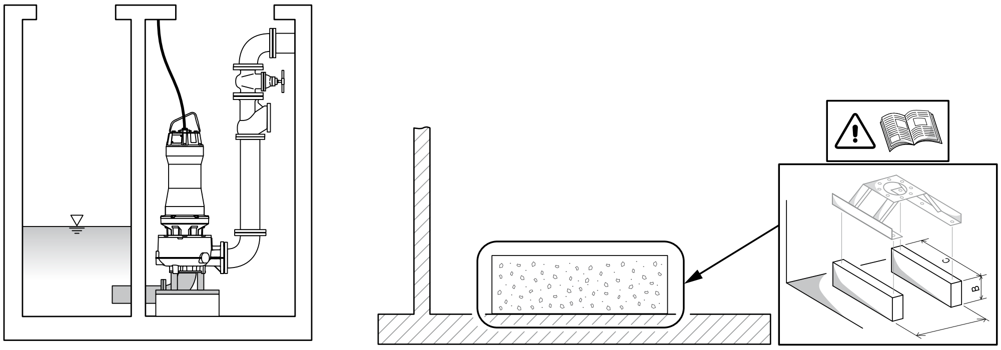
15

Installationsverfahren (ANHANG 2, S. 131)

1. Nachdem die Drehrichtung des Laufrads gemäß dem in der Betriebsanleitung beschriebenen Verfahren kontrolliert wurde, sicherstellen, dass die Elektromotorpumpe vom Stromnetz getrennt ist.
2. Eine angemessen dimensionierte Kette oder Rundschlinge an den Griff anschlagen und die Elektromotorpumpe auf den Sockel absenken. Darauf achten, dass sie nicht herabfallen und/oder ins Schwingen geraten kann.
3. Die Elektromotorpumpe mit den mitgelieferten Schrauben am Sockel befestigen.
4. Den Druckstutzen mit dem Standardflansch an die Rohrleitung anschließen. Entweder Edelstahlschrauben verwenden oder die Schrauben und Muttern mit einem geeigneten Produkt gegen Korrosion schützen. Es müssen ein Absperrschieber und ein Kugelrückschlagventil mit freiem Kugeldurchgang installiert werden; hierzu ein Verbindungsrohr verwenden, dessen Länge mindestens dem 5-fachen Durchmesser des Druckstutzens entspricht.
5. Für flexible Leitungen eine Schlauchtülle mit Flansch verwenden. Vorzugsweise sollte ein Schlauch mit Verstärkungsspirale oder ein halbstarrer Schlauch verwendet werden, um auch bei Bögen und Richtungsänderungen einen konstanten freien Durchgang zu gewährleisten. Den Schlauch mit einer Metallschelle am Anschluss sichern.
6. Eine angemessen dimensionierte Kette oder Rundschlinge an den Griff anschlagen und die Elektromotorpumpe in das Becken herablassen, bis sie stabil auf dem Boden aufsitzt. Darauf achten, dass die Elektromotorpumpe nicht herabfallen und/oder ins Schwingen geraten kann.
7. Die Stromkabel so sichern, dass sie nicht verdrehen, reißen oder von der Elektromotorpumpe eingesaugt werden können.
8. Die Stromkabel durch einen sauberen Kanal mit glatten Wänden aus dem Becken führen. Darauf achten, dass die Kabel nicht geknickt, gequetscht oder anderweitig beschädigt werden.
9. Die Stromkabel im Schaltschrank anschließen.

3.4.3 Vertikale Installation im Trockenschacht

Für die vertikale Installation im Trockenschacht wird **(Abb. 16)** die Elektromotorpumpe auf Anfrage mit einem Saugflansch geliefert, der für die Befestigung an einem Sauganschlussbogen (KBC) vorbereitet ist.



16

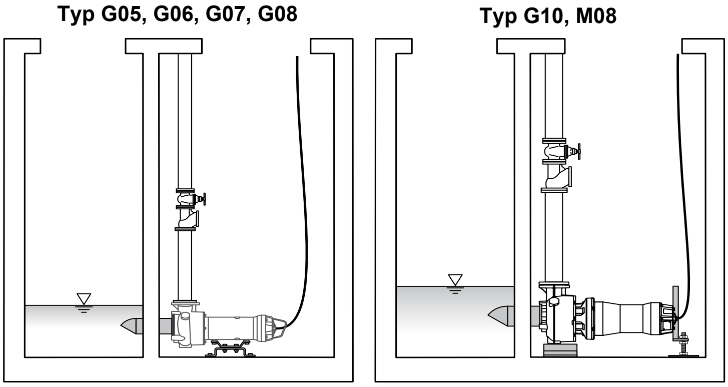
Installationsverfahren (ANHANG 3, S. 132)

1. Damit die richtige Höhe des Saugstutzens garantiert ist, müssen auf dem Beckenboden zwei Unterbauten errichtet werden, die aus einem für das Gewicht und die Beanspruchungen der Elektromotorpumpe geeigneten Material sind (Zement, Beton, Mauerwerk usw.). Die empfohlenen Abmessungen sind im technischen Datenblatt angegeben.
2. Nachdem die Drehrichtung des Laufrads gemäß dem in der Betriebsanleitung beschriebenen Verfahren kontrolliert wurde, sicherstellen, dass die Elektromotorpumpe vom Stromnetz getrennt ist.
3. Die Elektromotorpumpe am Sockel anbringen und den Sockel mit den Befestigungsschrauben befestigen.
4. Den Flanschrohrbogen mit den Befestigungsschrauben an den Saugstutzen der Elektromotorpumpe anschließen. Die Elektromotorpumpe ggf. absetzen und gegen ungewollte Bewegungen sichern.
5. Eine angemessen ausgelegte Kette oder Rundschlinge am Griff anschlagen und die Elektromotorpumpe in das Becken herablassen, wobei der Sockel auf den Unterbauten am Beckenboden positioniert wird.
6. Die Position der Befestigungsbohrungen markieren.

7. Die Bohrungen mit einem Durchmesser herstellen, der für die Befestigungslanglöcher im Sockel geeignet ist.
8. Der Sockel mit Verbundankern oder Spreizdübeln stabil an den zwei Unterbauten befestigen. Entweder Edelstahlschrauben verwenden oder die Schrauben und Muttern mit einem geeigneten Produkt gegen Korrosion schützen.
9. Das Ansaugrohr mit dem Flanschrohrbogen verbinden.
10. Das Druckrohr an die Elektromotorpumpe anschließen. Es müssen ein Absperrschieber und ein Kugelrückschlagventil mit freiem Kugeldurchgang installiert werden; hierzu ein Verbindungsrohr verwenden, dessen Länge mindestens dem 5-fachen Durchmesser des Druckstutzens entspricht.
11. Das Becken von Schutt und Abfällen säubern.
12. Die Stromkabel so sichern, dass sie sich nicht verdrehen und nicht reißen können.
13. Die Stromkabel durch einen sauberen Kanal mit glatten Wänden aus dem Becken führen. Darauf achten, dass die Kabel nicht geknickt, gequetscht oder anderweitig beschädigt werden.
14. Die Stromkabel im Schaltschrank anschließen.

3.4.4 Horizontale Installation im Trockenschacht

Für den horizontalen Einbau **(Abb. 17)** ist die Elektromotorpumpe für die Befestigung an der Tragkonstruktion aus Metall vorbereitet (KBS-H).



17

Installationsverfahren (Typ G05, G06, G07, G08) (ANHANG 4, S. 133)
1. Nachdem die Drehrichtung des Laufrads gemäß dem in der Betriebsanleitung beschriebenen Verfahren kontrolliert wurde, sicherstellen, dass die Elektromotorpumpe vom Stromnetz getrennt ist.
2. Den unteren Bügel am Beckenboden befestigen. Entweder Edelstahlschrauben verwenden oder die Schrauben und Muttern mit einem geeigneten Produkt gegen Korrosion schützen.
3. Den oberen Bügel an der Pumpe befestigen.
4. Die Pumpe absetzen und dabei den oberen Bügel auf den unteren positionieren.
5. Die Bügel mit den Schrauben gut aneinander befestigen.
6. Die Saug- und Druckleitungen anschließen. Es müssen ein Absperrschieber und ein Kugelrückschlagventil mit freiem Kugeldurchgang installiert werden; hierzu ein Verbindungsrohr verwenden, dessen Länge mindestens dem 5-fachen Durchmesser des Druckstutzens entspricht.
7. Das Becken von Schutt und Abfällen säubern.
8. Die Stromkabel so sichern, dass sie sich nicht verdrehen und nicht reißen können.
9. Die Stromkabel durch einen sauberen Kanal mit glatten Wänden aus dem Becken führen. Darauf achten, dass die Kabel nicht geknickt, gequetscht oder anderweitig beschädigt werden.
10. Die Stromkabel im Schaltschrank anschließen.

Installationsverfahren (Typ G10, M08) (ANHANG 4, S. 133)
1. Nachdem die Drehrichtung des Laufrads gemäß dem in der Betriebsanleitung beschriebenen Verfahren kontrolliert wurde, sicherstellen, dass die Elektromotorpumpe vom Stromnetz getrennt ist.
2. Die Elektromotorpumpe senkrecht auf einer ebenen und stabilen Fläche aufstellen.
3. Die Befestigungsschrauben des Hebegriffs (falls vorhanden) ausschrauben und den Hebegriff entfernen. Andernfalls die Hebeösen ausschrauben und entfernen.
4. Den oberen Bügel am Motordeckel der Elektromotorpumpe befestigen. Darauf achten, die Stromkabel nicht zu beschädigen.
5. Den Abstandhalter am oberen Bügel befestigen, ohne die Befestigungsmuttern festzuziehen.
6. Den unteren Bügel am Pumpengehäuse befestigen.
7. Mit einem Senklot die Position des Abstandhalters so regulieren, dass seine Auflageplatte komplanar zur Platte des unteren Bügels ist; dann die Muttern des Abstandhalters anziehen.
8. Die Elektromotorpumpe mit Hilfe eines geeigneten Hebezeugs (Kran, Flaschenzug) positionieren. Zum Anheben eine Kette oder Rundschlinge verwenden, deren Tragfähigkeit dem Gewicht der Elektromotorpumpe angemessen ist. Darauf achten, dass die Elektromotorpumpe nicht ins Schwingen gerät, wenn sie sich vom Boden löst.
9. Das System mit Verbundankern oder Spreizdübeln stabil am Beckenboden befestigen. Entweder Edelstahlschrauben verwenden oder die Schrauben und Muttern mit einem geeigneten Produkt gegen Korrosion schützen.
10. Die Saug- und Druckleitungen anschließen. Es müssen ein Absperrschieber und ein Kugelrückschlagventil mit freiem Kugeldurchgang installiert werden; hierzu ein Verbindungsrohr verwenden, dessen Länge mindestens dem 5-fachen Durchmesser des Druckstutzens entspricht.
11. Das Becken von Schutt und Abfällen säubern.
12. Die Stromkabel so sichern, dass sie sich nicht verdrehen und nicht reißen können.
13. Die Stromkabel durch einen sauberen Kanal mit glatten Wänden aus dem Becken führen. Darauf achten, dass die Kabel nicht geknickt, gequetscht oder anderweitig beschädigt werden.
14. Die Stromkabel im Schaltschrank anschließen.

4. ELEKTRISCHE ANSCHLÜSSE

4.1 Allgemeine Sicherheitshinweise

Alle Arbeiten für den Netzanschluss sind von Fachpersonal in Einklang mit den geltenden Vorschriften auszuführen. Die nicht fachgerechte Ausführung der elektrischen Anschlüsse kann zu Brandgefahr, Stromschlaggefahr und Beschädigungen des Produkts führen.

- Nicht verwendete Leiter müssen angemessen isoliert und innerhalb des Schaltschranks befestigt sein.
- Vor der Installation sicherstellen, dass die Netzspannung und die Netzfrequenz mit der Spannung und Frequenz, die auf dem Typenschild angegeben sind, übereinstimmen und dass die Stromaufnahme geringer als die maximale Stromstärke ist, die die Anlage abgeben kann.
- Die maximal zulässige Abweichung von der Nennspannung beträgt ± 5%.
- Maximal zulässige Phasenunsymmetrie: 2%
- Die Sicherungen und die Schutzschalter müssen auf die Eigenschaften der Anlage ausgelegt sein.
- Zum Schutz des Motors der Elektromotorpumpe einen Motorschutzschalter verwenden, der den auf dem Typenschild angegebenen Stromwerten angemessen ist.
- Sicherstellen, dass die thermischen Schutzvorrichtungen stets ordnungsgemäß angeschlossen sind. Der Nichtanschluss der thermischen Schutzvorrichtungen kann zur Entstehung von Gefahrensituationen und den Verfall des Gewährleistungsanspruchs führen.
- Die einwandfreie Funktionstüchtigkeit und elektrische Sicherheit der Elektromotorpumpen von ZENIT werden für die vom Werk gelieferte Konfiguration gewährleistet. Jede Änderung (z.B. das Hinzufügen eines Kabelstücks am Originalkabel) kann die Leistungsmerkmale der Elektromotorpumpe beeinträchtigen.

Vor der Installation und Erstinbetriebnahme die Unversehrtheit der Stromkabel überprüfen, um Kurzschlüsse zu vermeiden.

4.2 Kabel

- Sicherstellen, dass die Stromkabel vollkommen unversehrt sind und dass die Kabelenden keiner Feuchtigkeit ausgesetzt und nicht in Wasser eingetaucht waren.
- Die freien Kabelenden müssen an einen geprüften Schaltschrank angeschlossen werden, dessen Schutzart der Installationsumgebung entspricht.
- Die Stromkabel so sichern, dass sie nicht verdrehen, reißen oder gequetscht werden können.
- Beschädigte Kabel nicht selbst auswechseln, sondern Zenit oder ein autorisiertes Kundendienstzentrum kontaktieren.
- Probleme in Verbindung mit einem Spannungsabfall dürfen nicht unterschätzt werden.

Die freien Enden des Netzkabels sind an einen Ex-zertifizierten Schaltschrank anzuschließen, wenn dieser in einem explosionsgefährdeten Bereich aufgestellt ist.

4.3 Erdung

- Vorhandensein und Wirksamkeit der Erdungsanlage und des FI-Schalters prüfen.
- Sicherstellen, dass der Erdungsleiter ungefähr 150 mm länger als die anderen Leiter ist, damit er sich bei einem Versagen der Zugentlastung als letzter vom Schaltschrank löst.

Die Vorrüstung für den externen Erdungsanschluss ist für einen Kabelquerschnitt von mind. 4 mm² geeignet.

Das Erdungskabel nicht an Gasleitungen, Wasserleitungen, Blitzableiter oder Telefonkabel anschließen.
Eine unangemessene Erdung kann Stromschläge verursachen.

An den Ex-Schutz-Modellen ist sicherzustellen, dass ein externer Erdungsleiter (gelb/grün, Querschnitt mind. 4 mm²) mit einer sicheren Kabelbefestigung an den externen Erdungsanschluss der Pumpe angeschlossen ist.
Die Oberfläche des externen Erdungsanschlusses vor Anbringen der Kabelbefestigung reinigen.

4.4 Thermischer Schutz

Die Statorwicklungen der Pumpe sind mit thermischen Schutzvorrichtungen ausgestattet, die bei Überhitzung des Motors die Stromversorgung ausschalten.
Die serienmäßige thermische Schutzvorrichtung besteht aus Bimetallschaltern mit einer Nennschalttemperatur (NST) = 150 °C.
Auf Anfrage sind anstelle der Bimetallschalter PTC-Thermistoren oder Temperatursensoren mit Pt100-Messwiderstand erhältlich.
Die Kabel der thermischen Schutzvorrichtung sind mit einem Etikett mit der Aufschrift „TP“ (THERMAL PROTECTION) gekennzeichnet und müssen an die entsprechenden Klemmen im Schaltschrank angeschlossen werden.

Die thermischen Schutzvorrichtungen sind stets an einen Schaltschrank anzuschließen. Die Vorrüstung des Schaltschranks muss die Ausschaltung des Motors bei Auslösung der internen thermischen Schutzvorrichtung gewährleisten. Die Elektromotorpumpe ist gegen den automatischen Wiederanlauf zu sichern. Sie darf nur händisch von einem Bediener wieder eingeschaltet werden können, nachdem die Störungsursache beseitigt wurde.

4.5 Wasser-im-Öl-Sensor

Die Elektromotorpumpe kann mit einem Wasser-im-Öl-Sensor, ausgelegt als Einzeldrahtsonde, ausgerüstet werden, der das Eindringen von Wasser in die Ölkammer der Gleitringdichtungen erkennt und meldet (der Erdungsleiter dient für das Rückmeldesignal bei Erkennung der Leitfähigkeitsschwelle).
Bei der Meldung von eindringendem Wasser die Elektromotorpumpe ausschalten und die Instandsetzung durchführen.
Das Signalkabel ist mit einem Etikett mit dem Buchstaben **S** gekennzeichnet.

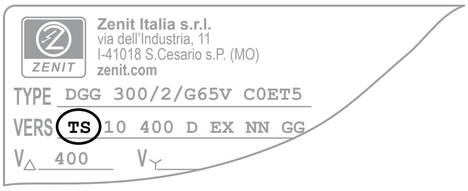
Bei Modellen mit zertifiziertem Ex-Schutz ist der Sensor über eine Sicherheitsbarriere mit galvanischer Trennung im sicheren Bereich im Schaltschrank anzuschließen.

Sicherheitsrelevante Stromwerte für den eigensicheren Sensor:
Sensor U_i: 30 V; I_i: 120 mA; P_i: 1,3 W
C_i: 0,3 nF; L_i: ~ 0 mH
Kabel C_c: 200 pF/m; L_c: 1 µH/m; L_c/R_c= 30 µH/Ω

4.6 Elektrischer Anschluss

Für den elektrischen Anschluss der Elektromotorpumpe wie folgt verfahren:

1. Dem Typenschild die erforderliche Anlaufschaltung entnehmen (Feld VERS) **(Abb. 18)**.
2. Den Erdungsleiter gemäß Anschlussplan an die zugehörige Klemme im Schaltschrank anschließen.
3. Das Stromversorgungskabel gemäß Anschlussplan an die hierfür vorgesehenen Klemmen im Schaltschrank anschließen.
4. Die Leiter der Überwachungseinrichtungen an die zugehörigen Klemmen im Schaltschrank anschließen.


Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
ZENIT
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⋎

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Zur Beachtung: Zur Ausführung der Anschlüsse unbedingt die Anschlusspläne einsehen.
Siehe spezifische, zum Lieferumfang der Pumpe zählende Dokumentation für die elektrischen Anschlüsse von nicht serienmäßigen Sensoren und Schutzvorrichtungen.

ANSCHLUSSPLÄNE AUF SEITE 123

5. INBETRIEBNAHME

ACHTUNG! Vor Ausführung jeglicher Tätigkeit sicherstellen, dass die Elektromotorpumpe und der Schaltschrank von der Elektroanlage getrennt sind und nicht unbeabsichtigt eingeschaltet werden können.

Vor der Einschaltung der Pumpe prüfen, ob:

- Öl in der Kammer der Gleitringdichtungen eingefüllt ist (siehe Abschnitt 6.5.3)
- das Laufrad ungehindert drehen kann
- das Gerät korrekt und stabil installiert ist
- die installierten Überwachungsvorrichtungen korrekt angeschlossen sind

5.1 Allgemeine Sicherheitshinweise

- Alle Arbeiten sind von qualifizierten Fachkräften auszuführen.
- Die Elektromotorpumpe darf nur mit installierten und funktionstüchtigen Sicherheitsvorrichtungen betrieben werden.
- Gegenstände und Personen müssen sich in einem Sicherheitsabstand zu den installierten Geräten befinden. Personen und Tiere dürfen nicht mit der Flüssigkeit in Kontakt kommen, in die die Geräte eingetaucht sind.
- Gemäß dem in der Betriebsanleitung beschriebenen Verfahren die korrekte Drehrichtung des Laufrads kontrollieren.

5.2 Einschalten

Die Pumpen dürfen nicht eingeschaltet werden, wenn im Becken eine explosionsfähige Atmosphäre vorhanden ist.

Nach Abschluss der Installation sollte eine Abnahmeprüfung der Anlage erfolgen, um ihre einwandfreie Funktionstüchtigkeit sicherzustellen.
Die Elektromotorpumpe darf nur mit installierten und funktionstüchtigen Sicherheitsvorrichtungen betrieben werden. Sicherstellen, dass alle Schutzvorrichtungen ordnungsgemäß angeschlossen ist.
Die Pumpe darf niemals im Trockenlauf arbeiten. Kontrollieren, ob sich der Flüssigkeitspegel oberhalb des Motors befindet.
Kontrollieren, ob die Schieberventile, sofern vorhanden, geöffnet sind.
Die Pumpe kurzzeitig einschalten, um folgende Kontrollen vorzunehmen:

- prüfen, ob die Stromaufnahme unterhalb des auf dem Typenschild angegeben Grenzwerts liegt;
- die einwandfreie Funktionsweise der Überwachungssysteme kontrollieren (keine Fehler- oder Warnmeldung);
- die korrekte Einstellung der Einschalt- und Ausschaltpegel (minimaler und maximaler Füllstand) kontrollieren.

ACHTUNG! Die maximal zulässige Anlaufzahl pro Stunde darf wegen der Gefahr von Motorschäden nicht überschritten werden.

ACHTUNG! Bei anormalen Betriebsgeräuschen oder Vibrationen der Pumpe, Störungen, Fehler- oder Warnmeldungen ist die Pumpe unverzüglich auszuschalten und erst nach Behebung der Störungsursache wieder einzuschalten.

5.3 Schalldruckpegel

Der Schalldruckpegel der in Betrieb befindlichen Elektromotorpumpe beträgt weniger als 70 dB.
Allerdings kann dieser Schwellenwert bei einigen Anlagen und an einigen Arbeitspunkten auf der Leistungskennlinie überschritten werden.
Den zulässigen Schalldruckpegel für die Aufstellungsumgebung des Produkts prüfen, um Verstöße gegen örtliche gesetzliche Bestimmungen zu vermeiden.

6. WARTUNG UND KUNDENDIENST

6.1 Vorbemerkung

Eine regelmäßige Wartung und eine periodische Inspektion sind für die Aufrechterhaltung der Leistungen der Pumpe unabdingbar. Aus diesem Grund muss das System in regelmäßigen Zeitabständen gereinigt, überholt und einer Inspektion unterzogen werden.
Sollte sich die Pumpe abweichend von den normal üblichen Betriebsbedingungen verhalten, ist das Kapitel “7. Störungen: Ursachen und Abhilfe” dieser Betriebsanleitung einzusehen und rechtzeitig zu intervenieren, um die vorliegende Störung zu beheben.

ACHTUNG! Die Anweisungen für die Kontrolle und Wartung dieser Pumpen sind nicht als Do-it-yourself-Anweisungen zu verstehen, sondern setzen einschlägige Fachkenntnisse voraus.

HINWEIS: Für die Kontrolle und den Ersatz der Bauteile sind Spezialwerkzeuge erforderlich.
Zur Durchführung dieser Arbeiten ist der Händler, bei dem das Produkt gekauft wurde, oder das nächste ZENIT Vertriebsbüro zu kontaktieren.

Für die Kontrolle und Reparatur von Ex-Schutz-Geräten sind die Vorgaben folgender Normen zu beachten:

- **EN 60079-17: Explosionsgefährdete Bereiche - Teil 17: Prüfung und Instandhaltung elektrischer Anlagen**
- **IEC 60034-23: Drehende elektrische Maschinen – Teil 23: Reparatur, Überholung und Sanierung**
- **EN 60079-19: Explosionsgefährdete Bereiche - Teil 19: Gerätereparatur, Überholung und Regenerierung**

Eingriffe an Elektromotorpumpen mit Ex-Schutz dürfen nur von qualifizierten Fachkräften bei einem für Eingriffe an Produkten mit Ex-Schutz autorisierten Kundendienstzentrum (gemäß den internationalen und/oder örtlichen Vorschriften) oder einem Zenit Kundendienstzentrum und nur unter Verwendung von Originalersatzteilen vorgenommen werden.
Bei Nichtbeachtung dieser Vorschrift wird die Ex-Schutz-Zertifizierung hinfällig.

6.2 Allgemeine Sicherheitshinweise

- Vor Ausführung jeglicher Tätigkeit an der in gesundheitsschädlichen Flüssigkeiten installierten Pumpe ist eine gründliche Reinigung der Pumpe, des Behälters usw. gemäß den örtlichen Vorschriften vorzunehmen.
- Vor Reinigungs- und/oder Wartungsarbeiten ist die Pumpe durch eine qualifizierte Fachkraft vom Stromnetz zu trennen. Diese muss sicherstellen, dass sie nicht unbeabsichtigt anlaufen kann.
- Immer zuerst die Phasenleiter und dann den grün-gelben Erdungsleiter abklemmen.
- Zur Vermeidung von Sach- und Personenschäden sicherstellen, dass die Pumpe nicht herabfallen oder wegrollen kann.
- Vor jedem Eingriff an der Pumpe ist ihre gesamte Oberfläche gründlich mit sauberem Wasser und/oder Spezialreinigern zu waschen.
- Bei längerem Betrieb kann die Oberfläche der Pumpe sehr heiß werden. Zur Vermeidung von Verbrennungen ist abzuwarten, bis sie abgekühlt ist.
- Stets die am Aufstellungsort geltenden Sicherheitsvorschriften, etwaige örtliche Bestimmungen und die Regeln des gesunden Menschenverstands beachten.

6.3 Regelmäßige Wartung und Service

Die Häufigkeit der Wartungsmaßnahmen hängt vom Installationstyp, vom Arbeitsaufkommen der Pumpe und von der Art der Flüssigkeit ab, in die sie eingetaucht wird.
Anlässlich der Tätigkeiten für die regelmäßige Wartung und immer dann, wenn die Leistung der Pumpe nachlässt oder die Vibrationen und der Geräuschpegel über das ursprüngliche Maß hinausgehen, ist eine sorgfältige Kontrolle der Verschleißteile erforderlich. Wenden Sie sich hierzu bitte an ein autorisiertes Kundendienstzentrum.

Intervall	Art der Überprüfung/Kontrolle	
	Standardmodell	Ex-Modell
Wöchentlich	Prüfen, ob die Stromaufnahme den angegebenen Nennwert nicht überschreitet.	
	Prüfen, ob sich die Versorgungsspannung innerhalb ± 5% des Nennwerts bewegt.	
Monatlich	Kontrolle der Pumpe: Ist eine erhebliche Abnahme der Leistungen der Pumpe zu verzeichnen, kann das Laufrad durch Schuttteile verstopft oder blockiert sein. Die Schuttteile entfernen und eventuell beschädigte Teile ersetzen. Kontrolle der Kabel: siehe Abschnitt 6.5.1 "Elektrokabel kontrollieren". Messung des Isolationswiderstands: Bezugswert für den Isolationswiderstand = min. 20 MΩ *HINWEIS: Ist der gemessene Isolationswiderstand sehr viel niedriger als der vorangegangene Messwert, muss der Motor kontrolliert werden.*	
Alle 6 Monate oder nach 3000 Betriebsstunden, je nachdem, was zuerst eintritt	Kontrolle und Reinigung der Kette oder des Hubseils: - Bei Beschädigung, Korrosion oder Verschleiß ersetzen - Etwaige Fremdkörper entfernen	
	Winden, Haken und Ketten auf Verschleiß, Beschädigung oder Korrosion kontrollieren. Reinigen und schmieren, sofern erforderlich, und beschädigte Teile und Komponenten ersetzen. Etwaige vorhandene Fremdkörper entfernen.	
	Prüfen, ob die Schrauben, Muttern und sonstigen Schraubteile korrekt festgezogen sind. Die Schrauben festziehen, sofern erforderlich, und die Schraubensicherung gegebenenfalls erneuern.	
	Die Verankerungen am Beckenboden nach jeder Entleerung kontrollieren.	
		Kabel, Öl, Gleitringdichtungen, Wälzlager, Verschleißteile (Laufrad, Saugflansch…) kontrollieren. Enthält das Öl Wasser, die Gleitringdichtungen kontrollieren. Siehe Abschnitt 6.5.3 "Kontrolle der Gleitringdichtungen und Ölwechsel". *HINWEIS: Bei einer Demontage der Pumpe zur Kontrolle sind die Komponenten aus Gummi (O-Ringe, Dichtungen) stets zu ersetzen.*
Jährlich	Kabel, Öl, Gleitringdichtungen, Wälzlager, Verschleißteile (Laufrad, Saugflansch…) kontrollieren. Enthält das Öl Wasser, die Gleitringdichtungen kontrollieren. Siehe Abschnitt 6.5.3 "Kontrolle der Gleitringdichtungen und Ölwechsel". *HINWEIS: Bei einer Demontage der Pumpe zur Kontrolle sind die Komponenten aus Gummi (O-Ringe, Dichtungen) stets zu ersetzen*	
Alle 2 Jahre oder alle 9.000 Betriebsstunden, je nachdem, was zuerst eintritt	Ölwechsel *HINWEIS: Siehe Abschnitt "Kontrolle der Gleitringdichtungen und Ölwechsel" für weiterführende Informationen.*	
	Austausch der Gleitringdichtungen *HINWEIS: Für die Kontrolle und den Austausch der Gleitringdichtungen sind Spezialwerkzeuge erforderlich. Zur Ausführung dieser Vorgänge und Eingriffe den Vertriebsvertreter, bei dem die Ausrüstung erworben wurde, oder den nächst gelegenen Händler des eigenen Gebiets kontaktieren.*	
		Austausch der Wälzlager.
Alle 2 – 5 Jahre	Revision: Die Pumpe muss überholt werden, auch wenn sie einwandfrei funktioniert. Wird die Pumpe im Dauerbetrieb eingesetzt, könnte eine vorzeitige Revision erforderlich sein.	

6.4 Reinigung

Rückstände von der Oberfläche der Pumpe entfernen und diese unter laufendem Wasser reinigen. Sollte der Hydraulikteil verstopft sein, muss er gründlich gesäubert werden. Bezüglich des Hydraulikteils stets mit besonderer Sorgfalt vorgehen und sämtliche Rückstände vollständig entfernen. Wird die Pumpe für gelegentliche Anwendungen eingesetzt, muss der Hydraulikteil nach jedem Gebrauch gewaschen werden, damit sich keine Verkrustungen bilden. Hierzu das Gerät einige Pumpzyklen mit sauberem Wasser ausführen lassen.
Es ist darauf zu achten, dass sich auf den Schwimmerschaltern keine Ablagerungen bilden, um die Einhaltung der Start- und Stopp-Schwellen zu gewährleisten.

6.5 Kontrollen

Prüfen, ob die Pumpe keine Schäden aufweist und die Schrauben, Muttern und sonstigen Schraubteile korrekt festgezogen sind. Die Schrauben mit dem vorgesehenen Anzugsmoment festziehen (siehe Abschnitt 6.6) und, sofern erforderlich, die Schraubensicherung gegebenenfalls erneuern.

6.5.1 Elektrokabel kontrollieren

Kabel und Leiter sind im besonderen Maße möglichen Beschädigungen ausgesetzt. Deshalb sind sie regelmäßig und bei jeder sich bietenden Gelegenheit zu kontrollieren.
Prüfen, ob das Elektrokabel intakt und weder gequetscht, eingeschnitten oder auf andere Art und Weise verschlissen ist.
Ein beschädigtes Kabel kann dazu führen, dass Flüssigkeit in die Pumpe gelangt, wodurch Stromverlust, Kurzschlüsse, Stromschläge oder Brände nicht auszuschließen sind.
Prüfen, ob die Kabeldurchführung intakt ist.
Beschädigte oder defekte Teile und Komponenten müssen umgehend ersetzt werden.

6.5.2 Wälzlager kontrollieren

Alle Lager sind mit Wälzelementen versehen und auf Lebenszeit geschmiert.
Die Welle von Hand drehen und kontrollieren, ob die Bewegung ruckfrei und ohne anormale Laufgeräusche erfolgt. Andernfalls die Lager ersetzen.

Defekte Lager können den Ex-Schutz mindern

6.5.3 Kontrolle der Gleitringdichtungen und Ölwechsel

Der Ölwechsel und die Inspektion der Gleitringdichtungen sind notwendig, sobald der Wasser-im-Öl-Sensor das Eindringen von Wasser in das Innere der Ölkammer erfasst.
Die Ölkammer ist so ausgelegt, dass bei ihrer Befüllung mit der Pumpe in Vertikalstellung die richtige Ölmenge erreicht ist, wenn sich der Ölpegel an der Einfüllöffnung (Ölverschluss) befindet.

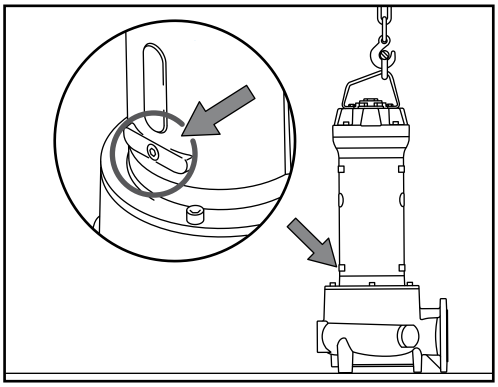
Öl des Typs TOTAL Bio Hydraulic TMP FR46 oder gleichwertig mit ISO-Viskositätsklasse (kinematische Viskosität bei 40 °C) 40–90 cSt, Flammpunkt ≥ 240 °C

Sollte die angegebene Ölsorte nicht erhältlich sein, wenden Sie sich bitte an Zenit.

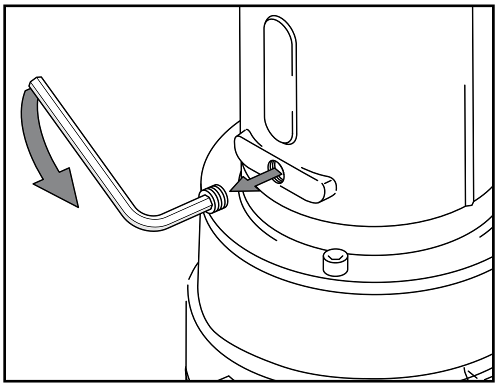
In der Ölkammer kann sich infolge einer etwaigen Undichtheit der Gleitringdichtung ein Überdruck aufgebaut haben. Den Verschluss daher mit einem ausreichend großen Lappen bedecken und langsam abschrauben.

Das Altöl darf nicht in die Umwelt gelangen, sondern ist bei einer Altölsammelstelle abzugeben.

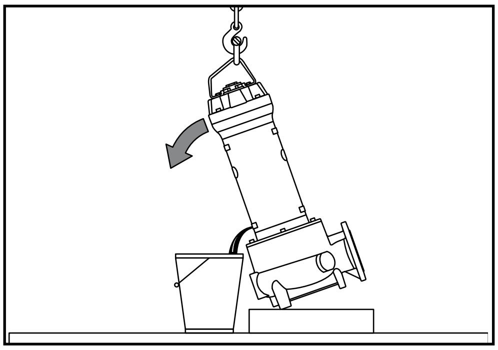
Ölwechsel
Gehäusetyp G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L



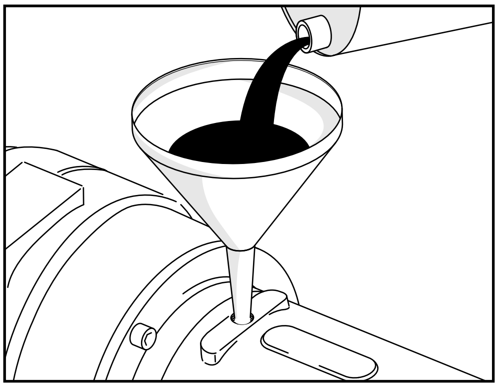
1. Die Elektromotorpumpe auf einem ebenen und stabilen Untergrund aufstellen. Ein geeignetes Hebesystem mit angemessener Tragfähigkeit verwenden.
   Die Elektromotorpumpe sichern, damit sie nicht ins Rollen oder Schwingen kommt.
2. Die Verschlüsse der Ölkammer der Elektromotorpumpe identifizieren.



3. Den Verschluss der Ölkammer abschrauben.

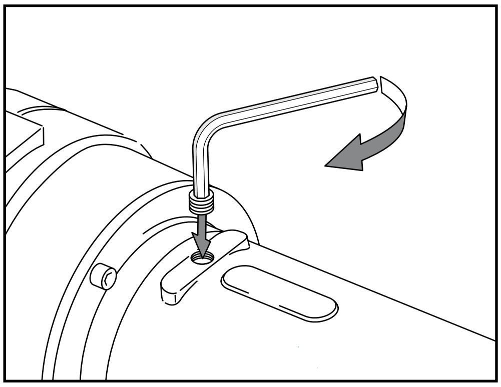


4. Das Öl in einen ausreichend großen und nach Möglichkeit transparenten Behälter ablaufen lassen.
5. Den Behälter mit dem Öl auf eine waagerechte Fläche stellen und einige Minuten ruhen lassen, damit sich das eventuell vorhandene Wasser auf dem Boden absetzen kann:
   - Sauberes Öl ohne Wasser: Die Gleitringdichtung befindet sich in einem guten Zustand; es kann neues Öl eingefüllt werden.
   - Öl mit einem geringfügigen Wasseranteil: Dies kann auf das Setzen der Gleitringdichtung in den ersten Betriebsstunden zurückzuführen sein und stellt daher kein Problem dar.
   - Öl mit Wasser und Verunreinigungen: Die Gleitringdichtung muss durch eine neue ersetzt werden. Der Austausch muss von einem autorisierten Kundendienstzentrum durchgeführt werden.



6. Die Pumpe waagrecht auf die Werkbank legen
7. Die Ölkammer der Gleitringdichtungen mit biologisch abbaubarem Schmieröl

Gehäusetyp	Ölmenge Kammer der Gleitringdichtungen (ml)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

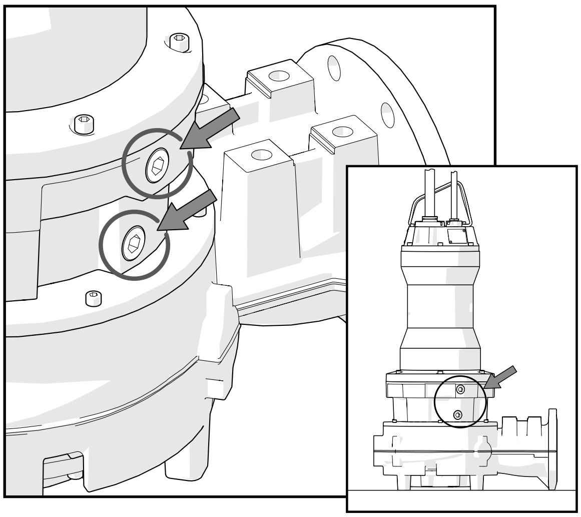


8. Den Verschluss der Ölkammer einschrauben.

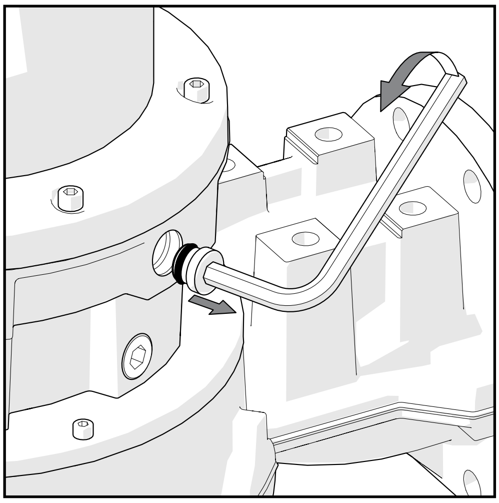
ACHTUNG! **Eine Schraubensicherung vom Typ Loctite 243 verwenden.**

Gehäusetyp	Ölverschluss
G05M - G05L **G06S - G06L** **G07S - G07L** **G08L**	1/8” NPT
G10S - G10L	3/8” DIN 906

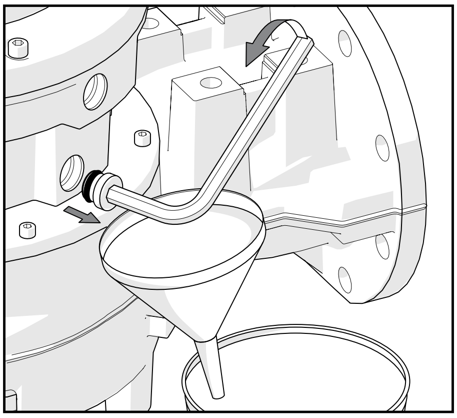
Ölwechsel
Gehäusetyp M08S - M08L



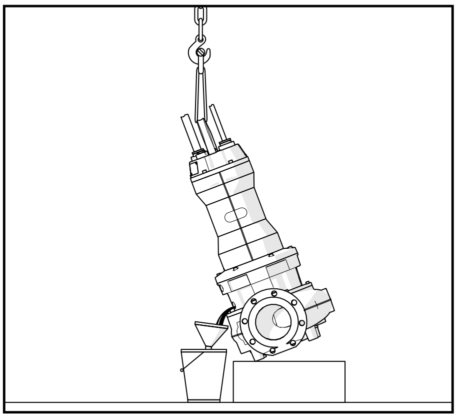
1. Die Elektromotorpumpe auf einem ebenen und stabilen Untergrund aufstellen. Ein geeignetes Hebesystem mit angemessener Tragfähigkeit verwenden. Die Elektromotorpumpe sichern, damit sie nicht ins Rollen oder Schwingen kommt.
2. Die Verschlüsse der Ölkammer der Elektromotorpumpe identifizieren.



3. Den oberen Verschluss der Ölkammer abschrauben.

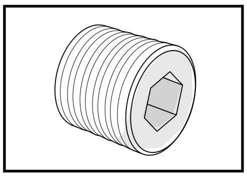


4. Den unteren Verschluss der Ölkammer abschrauben.



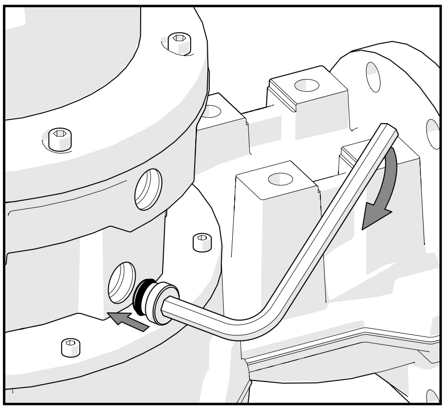
5. Das Öl in einen ausreichend großen und nach Möglichkeit transparenten Behälter ablaufen lassen.
HINWEIS: Die richtige Größe dieses Behälters kann man anhand der in der Ölkammer enthaltenen Ölmenge bestimmen, die in der Tabelle angegeben ist.

6. Den Behälter mit dem Öl auf eine waagerechte Fläche stellen und einige Minuten ruhen lassen, damit sich das eventuell vorhandene Wasser auf dem Boden absetzen kann:
   - Sauberes Öl ohne Wasser: Die Gleitringdichtung befindet sich in einem guten Zustand; es kann neues Öl eingefüllt werden.
   - Öl mit einem geringfügigen Wasseranteil: Dies kann auf das Setzen der Gleitringdichtung in den ersten Betriebsstunden zurückzuführen sein und stellt daher kein Problem dar.
   - Öl mit Wasser und Verunreinigungen: Die Gleitringdichtung muss durch eine neue ersetzt werden. Der Austausch muss von einem autorisierten Kundendienstzentrum durchgeführt werden.

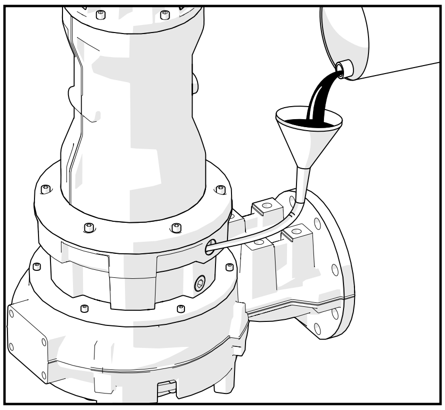


Gehäusetyp	Ölkammerverschluss
M08S - M08L	2x 3/8” DIN 906

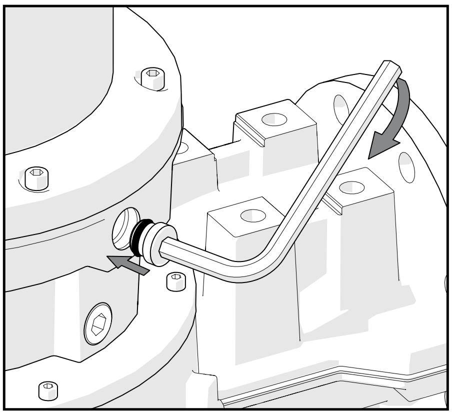
ACHTUNG! **Eine Schraubensicherung vom Typ Loctite 243 verwenden.**



7. Den unteren Verschluss der Ölkammer einschrauben.



8. Die Ölkammer der Gleitringdichtungen mit biologisch abbaubarem Schmieröl



9. Den oberen Verschluss der Ölkammer einschrauben.

Gehäusetyp	Ölmenge Kammer der Gleitringdichtungen (ml)
M08S - M08L	2300

6.6 Schrauben und Kleinteile

Für den Ersatz von Schrauben und Kleinteilen stets Produkte der Klasse A2 70, A2 80, A4 70 oder A4 80 gemäß der Norm ISO 3506-1 verwenden.

Anzugsmomente (Nm)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. ENTSORGUNG

Zur korrekten Entsorgung des Produkts sind die verschiedenen Teile und Komponenten nach Materialart zu trennen und einer Abfallentsorgungsstelle mit getrennter Sammlung zuzuführen.
Gemäß den geltenden örtlichen Vorschriften ein öffentliches oder privates Unternehmen für die Abfallentsorgung beauftragen.

Das Symbol der durchgestrichenen Abfalltonne auf Rädern auf dem Gerät oder auf der Verpackung weist darauf hin, dass das Produkt am Ende seines Lebenszyklus nach Materialart zerlegt und einer getrennten Abfallsammlung zugeführt werden muss und nicht als unsortierter Siedlungsabfall entsorgt werden darf.

Die korrekte getrennte Sammlung für die Weiterleitung des außer Betrieb genommenen Geräts zum Recycling, zur Aufbereitung und zur umweltverträglichen Entsorgung trägt zur Vermeidung eventueller negativer Auswirkungen auf die Umwelt und die Gesundheit bei und begünstigt die Wiederverwendung und/oder Wiederverwertung der Materialien, aus denen das Gerät besteht.
Eine rechtswidrige Entsorgung des Produkts durch den Benutzer steht unter Strafe und wird nach den geltenden Vorschriften mit einem Bußgeld.

8. STÖRUNGEN: URSACHEN UND ABHILFE

	Störung	**Mögliche Ursache**	**Lösung**
1	Die Pumpe läuft nicht an, oder sie läuft an, stoppt aber dann unmittelbar danach	Unangemessene oder unzureichende Stromversorgung (z.B. Stromunterbrechung, Spannungsabfall usw.)	Fachpersonal kontaktieren.
		Kabel abgeklemmt oder beschädigt	Die Unversehrtheit des Kabels kontrollieren und prüfen, ob die Verbindung zum Netz korrekt ausgeführt ist
		Defekt des Schaltschranks	Fachpersonal kontaktieren, um die Ursache des Defekts ausfindig zu machen
		Sicherungen durchgeschmolzen	Sicherungstyp kontrollieren und die Sicherungen durch andere mit geeignetem Wert austauschen
		Thermomagnetischer Schutzschalter ausgelöst	s. Punkt 2
		Thermischer Schutz ausgelöst	s. Punkt 3
		Alarm vom Wasser-im-Öl-Sensor	s. Punkt 4
		FI-Schalter ausgelöst (RCD)	s. Punkt 5
		Kondensator beschädigt oder falsch angeschlossen (Motor ~1)	Für den Austausch des Kondensators Fachpersonal kontaktieren oder prüfen, ob dieser richtig angeschlossen ist
		Niveausensor ausgelöst	Korrekten Anschluss und Funktionstüchtigkeit des Niveausensors kontrollieren
2	Thermomagnetischer Schutzschalter ausgelöst	Versorgungsspannung zu niedrig oder Phasen nicht ausgewogen.	Fachpersonal kontaktieren
		Falscher elektrischer Anschluss	Fachpersonal kontaktieren, um den elektrischen Anschluss kontrollieren und korrigieren zu lassen
		Überstromrelais auf einen zu niedrigen Wert eingestellt oder beschädigt	Überstromrelais kontrollieren. Relais gemäß dem auf dem Typenschild angegebenen Stromwert einstellen
		Kurzschluss der Wicklung	Ein autorisiertes Kundendienstzentrum kontaktieren
		Hydraulikteil durch Fremdkörper blockiert	Hydraulikteil reinigen und Fremdkörper entfernen
		Rotor blockiert	Ein autorisiertes Kundendienstzentrum kontaktieren
3	Thermischer Schutz wird nach kurzer Betriebszeit ausgelöst	Pumpe in zu heiße Flüssigkeit getaucht	Temperatur der Flüssigkeit senken
		Hydraulikteil durch Fremdkörper blockiert	Hydraulikteil reinigen und Fremdkörper entfernen
		Innenteile beschädigt	Ein autorisiertes Kundendienstzentrum kontaktieren
		Falsche Spannung	Kontrollieren, ob die Versorgungsspannung dem Spannungswert auf dem Typenschild entspricht
		Wälzlager defekt oder verschlissen	Ein autorisiertes Kundendienstzentrum kontaktieren
		Zu viele Anläufe pro Stunde	s. Punkt 6
4	FI-Schalter ausgelöst (RCD)	Feuchtigkeit im Motor	Ein autorisiertes Kundendienstzentrum kontaktieren
		Motor schlecht isoliert	Ein autorisiertes Kundendienstzentrum kontaktieren
		Kabel beschädigt	Die Unversehrtheit des Kabels kontrollieren und für den etwaigen Ersatz ein Kundendienstzentrum kontaktieren

5	Die Pumpe funktioniert, doch nur mit geringer oder keiner Förderleistung	Hydraulikteil durch Fremdkörper blockiert	Hydraulikteil reinigen und Fremdkörper entfernen
		Druckleitung durch Fremdkörper blockiert	Druckleitung reinigen
		Rückschlagventil blockiert	Rückschlagventile reinigen
		Absperrschieber teilweise geschlossen oder blockiert	Absperrschieber öffnen und ggf. reinigen
		Falsche Drehrichtung des Laufrads	Die Drehrichtung kontrollieren und zwei der drei Phasen umstecken
		Leckagen an der Anlage	Die Anlage kontrollieren und die Ursache der Leckagen beheben
		Falsche Pumpe ausgewählt	Pumpe gegen eine angemessene Version auswechseln
6	Zu viele Anläufe pro Stunde	Niveausensoren falsch eingestellt	Niveausensoren richtig einstellen
		Funktionsstörung der Niveausensoren	Funktionstüchtigkeit der Sensoren überprüfen
		Verwirbelungen in der Nähe der Niveausensoren	Verwirbelungsursache beseitigen oder Position der Niveausensoren ändern
		Schacht zu klein	Schachtgröße verändern
7	Vibrationen oder zu lautes Laufgeräusch	Innenteile beschädigt	Ein autorisiertes Kundendienstzentrum kontaktieren
		Wälzlager defekt oder verschlissen	Ein autorisiertes Kundendienstzentrum kontaktieren
		Laufrad verstopft, unausgewuchtet oder beschädigt	Ein autorisiertes Kundendienstzentrum kontaktieren
		Laufrad blockiert	Laufrad reinigen und Blockierung beseitigen
		Falsche Drehrichtung des Laufrads	Die Drehrichtung kontrollieren und zwei der drei Phasen umstecken
		Phasenausfall	Fachpersonal kontaktieren
		Schwingungen der Anlage	Anlage kontrollieren
8	Pumpe arbeitet mit zu hoher Stromaufnahme	Arbeitspunkt falsch	Sicherstellen, dass die Pumpe innerhalb ihres Arbeitsbereichs arbeitet
		Falsche Versorgungsspannung	Versorgungsspannung wieder auf den am Typenschild angegebenen Wert bringen
		Hydraulikteil durch Fremdkörper blockiert	Hydraulikteil reinigen und Fremdkörper entfernen
		Wälzlager defekt oder verschlissen	Ein autorisiertes Kundendienstzentrum kontaktieren
		Falsche Drehrichtung des Laufrads	Die Drehrichtung kontrollieren und zwei der drei Phasen umstecken
		Statorwicklung defekt	Ein autorisiertes Kundendienstzentrum kontaktieren
9	Erfassung des Eindringens von Wasser	Eindringen von Wasser in den Motor aufgrund von beschädigten Kabeln, O-Ringen oder Kabeldurchführungen	Ein autorisiertes Kundendienstzentrum kontaktieren
		Eindringen von Wasser in die Ölkammer aufgrund verschlissener oder beschädigter Gleitringdichtungen oder O-Ringe	

Für Reparaturen oder sonstige Anfragen sind folgende Informationen zum Produkt anzugeben:

Modell	**Seriennummer**	**Kaufdatum**

Anmerkungen:

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Para instalar el producto correctamente y utilizarlo de forma segura, lea atentamente este manual y guárdelo con cuidado en un lugar limpio y fácilmente accesible para futuras consultas.
El uso impropio del producto puede provocar daños graves a cosas y a personas, causar un funcionamiento anómalo e invalidar la garantía.

1. INFORMACIÓN GENERAL

1.1 Identificación del fabricante

ZENIT Italia S.r.l. - via dell'Industria, 11 - 41018 S. Cesario sul Panaro (Módena) - Italia

1.2 Significado de los símbolos utilizados en el manual

⚠	Atención. Peligro para la seguridad de los operadores y la protección de la electrobomba
⚡	Atención. Presencia de riesgos de tipo eléctrico
♨	Atención. Presencia de superficies muy calientes con peligro de quemaduras
Ex	Atención. Instrucciones referidas a los modelos con certificación -Ex. El incumplimiento de estas instrucciones puede causar peligro de explosión. Es recomendable seguir estas instrucciones también para los modelos estándar.
¡ATENCIÓN!	Información importante que merece especial atención

⚠ 1.3 Advertencias generales de seguridad

- El aparato no es apto para ser utilizado por personas no capacitadas y/o inexpertas. Manténgalo fuera del alcance de los niños.
- Las operaciones de instalación deben ser realizadas por personal técnico competente que sea capaz de comprender el contenido del manual. El personal encargado de la instalación y el mantenimiento del producto debe disponer de la formación necesaria acerca de los riesgos residuales relacionados con los aparatos eléctricos.
- Asegúrese de que nadie pueda caer accidentalmente en el depósito; si procede, instale una cubierta o una barandilla de protección.
- Durante las operaciones de desplazamiento, instalación o desinstalación, el aparato debe desconectarse de la alimentación eléctrica.
- Preste atención al riesgo que crean los gases y los vapores en el interior de la zona de trabajo.
- No ingiera ni inhale ningún componente del aparato.
- Las personas y los animales no deben sumergirse ni entrar en contacto con el líquido mientras no se haya extraído la electrobomba del depósito.
- No ponga en contacto el extremo libre del cable eléctrico con ningún tipo de líquido.
- El sistema eléctrico debe contar con una conexión de tierra eficiente.
- Antes de conectar la alimentación eléctrica, asegúrese de que el aparato esté instalado correctamente y sitúese a una distancia segura.
- No utilice el aparato para fines distintos de aquellos para los que ha sido diseñado y fabricado, ya que el fabricante no se hace responsable de los daños personales o materiales causados por el aparato si se utiliza de forma distinta de la descrita en el manual o si no se respetan las disposiciones de mantenimiento y seguridad; antes de instalarlo en ambientes químicamente agresivos, póngase en contacto con el fabricante para comprobar la compatibilidad de los materiales.
- No modifique la electrobomba ni sus partes bajo ningún concepto (conexiones, orificios, acabados, etc.).
- El usuario debe respetar las normas de seguridad vigentes en el país de uso, así como las reglas dictadas por el sentido común, y debe asegurarse de que las operaciones periódicas de limpieza y mantenimiento se realicen correctamente.
- El instalador tiene la obligación de comprobar que las condiciones ambientales de uso sean correctas, a fin de garantizar la seguridad y la higiene.
- Las responsabilidades del personal autorizado para usar el producto se delegan en el cliente.

1.4 Formación del personal encargado de la instalación y el mantenimiento

El personal encargado de la instalación y el mantenimiento del producto debe disponer de la formación necesaria acerca de los riesgos no eliminables relacionados con los aparatos eléctricos que funcionan en contacto con líquidos biológicos.
Además, debe ser capaz de leer y comprender el contenido de la documentación técnica adjunta al producto, especialmente los esquemas eléctricos de conexión.

1.5 Equipos de protección individual (EPI) necesarios

Durante el manejo de la electrobomba, lleve los equipos de protección individual preceptivos.
Es obligatorio usar guantes de protección, calzado de seguridad, gafas de protección con protecciones laterales y delantal de cuero.
Antes de manejar el producto tras la instalación, lávelo abundantemente con agua corriente y/o detergente.

1.6 Riesgos residuales

El producto ha sido diseñado y fabricado con el fin de garantizar un uso seguro y fiable.
No obstante, dado que se destina al uso con líquidos peligrosos para la salud, los encargados de la instalación y el mantenimiento deberán prestar la máxima atención y utilizar siempre equipos de protección individual de conformidad con la ley.
Al realizar cualquier tipo de actividad en el producto, es importante impedir toda caída accidental de la electrobomba, así como no subestimar los peligros de quemadura, choque eléctrico, ahogamiento, asfixia o envenenamiento a causa de la inhalación de gases tóxicos.

⚡ ⚠ Ex **Para reducir los riesgos relacionados con las descargas atmosféricas, el usuario deberá instalar las medidas oportunas de protección contra rayos.**
Las juntas con marcado -Ex no deben someterse a reparaciones.
No abra el aparato en presencia de atmósferas explosivas.

Durante las operaciones de desplazamiento, instalación o desinstalación, la electrobomba debe desconectarse del cuadro eléctrico.

1.7 Descripción del producto / Usos previstos

Estos productos se destinan al uso en estaciones de depuración y estaciones de elevación en instalaciones civiles, industriales y municipales. Son idóneos para elevar y desplazar lodos, materia fecal y aguas limpias, residuales y cargadas de cuerpos sólidos o fibrosos.

No se pueden utilizar con líquidos para uso alimentario ni en atmósferas potencialmente explosivas (a excepción de los modelos con certificación antideflagrante).

Las bombas sumergibles serie Grey jamás deberán utilizarse para bombear líquidos explosivos, inflamables o combustibles. Los modelos -Ex están certificados para el uso en atmósferas potencialmente explosivas conforme al marcado que aparece en la placa de datos (véase el apartado 1.12).

Esta electrobomba debe fijarse a un soporte o instalarse en un ambiente específico. No se ha diseñado para sujetarla con las manos durante el uso. MotoresLos motores de las bombas Grey de ZENIT siempre están equipados con un cable flexible para la alimentación eléctrica, el control y los circuitos de supervisión. El prensacable garantiza la estanqueidad y la función antitirones para proporcionar una instalación segura. No se requieren elementos adicionales de equipamiento del aparato. La conexión a la instalación y el cuadro eléctrico corren a cargo del cliente y deben ser adecuados para las características del aparato.

Las bombas sumergibles serie Grey se clasifican en función del tipo de hidráulica.

- Modelos DGG: bombas sumergibles con turbina vortex en posición retraída y amplio paso libre;
  Aplicaciones: líquidos biológicos cargados y de alcantarillado en instalaciones de elevación civiles e industriales, instalaciones de tratamiento de aguas residuales y explotaciones ganaderas.
- Modelos DRG: bombas sumergibles con turbina de canales;
  Aplicaciones: aguas residuales industriales y aguas de proceso, elevación en instalaciones civiles, drenaje y elevación de aguas residuales de tanques de primer lavado.
- Modelos GRG: bombas sumergibles con turbina multicanal y sistema de trituración;
  Aplicaciones: elevación de líquidos que contienen fibras o cuerpos filamentosos en aplicaciones profesionales e industriales o explotaciones ganaderas.
- Modelos APG: bombas sumergibles con turbina multicanal de gran altura de elevación;
  Aplicaciones: elevación de aguas claras y arenosas, meteóricas y de infiltración.

1.7.1 Identificación del modelo

La bomba puede identificarse mediante los campos TYPE y VERS que aparecen en la placa de datos. Véase el apartado 1.12.

Tipo

DG G 300/2/ G 65 V C 0 E T 5
(A) (B) (C)
① ② ③ ④ ⑤⑥⑦⑧⑨

① Tipo de turbina
DG = Vortex
DR = De canales
GR = Trituradora
AP = De gran altura de elevación
② Serie
G = Grey

③ Potencia (CV × 100) / polos motor
④ Salida
(A) TIPO (rosca GAS/brida)
(B) DIÁMETRO (mm)
(C) POSICIÓN
V = vertical H = horizontal

⑤ Variante hidráulica
⑥ Versión hidráulica
⑦ Tamaño del motor
⑧ Fases del motor
M = Monofásico T = Trifásico
⑨ Frecuencia
5 = 50 Hz 6 = 60 Hz

Versión

TS 10 400 D EX NN GG
⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Variante eléctrica
⑪ Longitud del cable (m)
⑫ Tensión nominal

⑬ Arranque
D = DOL (directo)
Y = estrella/triángulo
⑭ Certificación
NN = estándar
EX = ATEX, ATEX + IECEx
CX = IECEX

⑮ Personalizaciones
⑯ Material de la turbina

1.8 Datos técnicos

Las características y los datos técnicos del producto se indican en la ficha técnica.
La siguiente tabla muestra los tipos de carcasa en relación con las dimensiones del motor.

Versión MONOFÁSICA

Tipo	Descripción _②③_⑦⑧_	P2 (kW)/ polos
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

Versión TRIFÁSICA

Tipo	Descripción _②③_⑦⑧_	P2 (kW)/ Polos
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

Versión TRIFÁSICA

Tipo	Descripción _②③_⑦⑧_	P2 (kW)/ Polos
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

1.9 Condiciones de funcionamiento

Para utilizar la bomba de forma correcta, deberán respetarse las siguientes condiciones de funcionamiento:

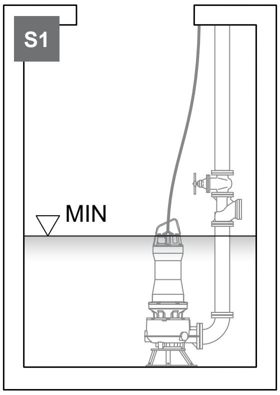
- Temperatura del líquido/ambiente: 0 ÷ 40 °C
- pH: 6 ÷ 14
- Servicio: Modelos monofásicos: S1 - bomba completamente sumergida **(Fig. 1)**
  Modelos trifásicos: S1 - bomba completamente sumergida **(Fig. 1)**
  S3 - cuerpo de la bomba completamente sumergido o lleno **(Fig. 2A, 2B, 2C)** según el valor S3% que aparece en la placa de datos, indicado en la **Tabla 1.**
- Arranques por hora: máx. 20 para motores con potencia P2 hasta 10 kW, máx. 15 para P2 superior a 10 kW

1.10 Condiciones especiales

La electrobomba solamente puede trabajar en servicio continuo (S1) si está completamente sumergida.
En las instalaciones en seco, el aparato deberá trabajar en servicio intermitente periódico (S3).

Deben utilizarse como mínimo dos sensores de nivel (redundantes) para interrumpir la alimentación cuando el líquido cae por debajo del nivel mínimo:
S1 - bomba completamente sumergida **(Fig. 1)**
S3 - cuerpo de la bomba completamente sumergido o lleno **(Fig. 2A, 2B, 2C)**

¡ATENCIÓN! **Compruebe siempre que la bomba trabaje con el nivel mínimo correcto de líquido (véase el apartado 3.3). Conviene comprobar siempre el correcto funcionamiento de la electrobomba en las condiciones de nivel mínimo. Según el tipo específico de instalación, puede que sea necesario tomar otras medidas para evitar que se formen remolinos y que entre aire en la aspiración de la electrobomba.**



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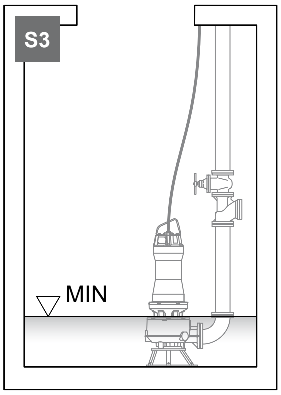
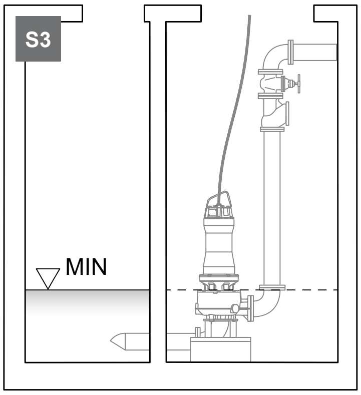
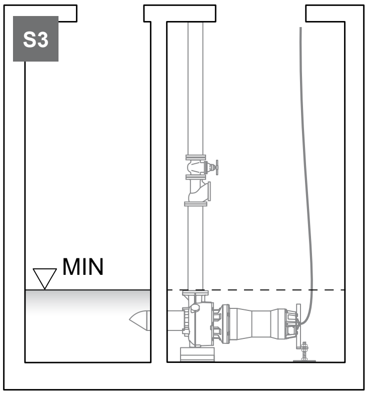


2A



2B



2C

Para interrumpir la alimentación en caso de sobrecalentamiento del motor, el aparato está equipado de serie con una protección térmica en el interior de los arrollamientos del estator (véase el apartado 4.4).

Es obligatorio que el usuario conecte las protecciones térmicas con un cuadro de control que esté dotado de una unidad de desconexión y esté diseñado para evitar el rearranque automático del aparato.

Funcionamiento mediante convertidor de frecuencia: las protecciones térmicas deben conectarse correctamente en el cuadro eléctrico, de forma que corten la alimentación en caso de sobrecalentamiento del motor.

Las bombas Grey están equipadas con una sonda de humedad para detectar la presencia de agua en el interior de la cámara de aceite (compartimiento de los cierres mecánicos).

La sonda de humedad debe conectarse correctamente, de acuerdo con las instrucciones del apartado 4.5.

La tornillería y las fijaciones deben ser de clase A2-70, A2-A80, A4-70 o A4-80 de conformidad con la norma EN ISO 3506-1.

La bomba en versión -Ex puede trabajar en servicio S3 según el valor S3% que aparece en la placa de datos, como se indica en la siguiente tabla:

tabla 1: Servicio S3 para modelos versión -Ex

Tipo de carcasa	Descripción _ ② ③_⑦ ⑧_	P2 (kW)/ Polos	Servicio
G05M	_G 75/2_AT_	0.55/2	50%
	_G 100/2_AT_	0.75/2	50%
G05L	_G 150/2_AT_	1.1/2	30%
	_G 200/2_AT_	1.5/2	30%
	_G 250/2_AT_	1.8/2	20%
	_G 100/4_AT_	0.75/4	15%
	_G 150/4_AT_	1.1/4	15%
	_G 200/4_AT_	1.5/4	15%
G06S	_G 300/2_ET_	2.2/2	20%
	_G 200/4_ET_	1.5/4	20%
G06L	_G 400/2_ET_	3/2	20%
	_G 250/4_ET_	1.8/4	20%
	_G 300/4_ET_	2.2/4	20%
	_G 400/4_ET_	3/4	15%
G07S	_G 550/2_FT_	4/2	20%
	_G 750/2_FT_	5.5/2	15%
G07L	_G 1000/2_FT_	7.5/2	10%
	_G 550/4_FT_	4/4	15%
	_G 750/4_FT_	5.5/4	15%

Tipo de carcasa	Descripción _ ② ③_⑦ ⑧_	P2 (kW)/ Polos	Servicio
G08L	_G 1200/2_GT_	9/2	15%
	_G 1500/2_GT_	11/2	15%
	_G 1750/2_GT_	13/2	10%
	_G 1000/4_GT_	7.5/4	15%
G10S	_G 2000/2_HT_	15/2	10%
	_G 1200/4_HT_	9/4	15%
	_G 1500/4_HT_	11/4	10%
	_G 1000/6_HT_	7.5/6	10%
G10L	_G 2500/2_HT_	18.5/2	15%
	_G 2000/4_HT_	15/4	15%
	_G 1200/6_HT_	9/6	15%
	_G 1500/6_HT_	11/6	15%
	_G 1750/6_HT_	13/6	15%
M08S	_G 400/6_GT_	3/6	20%
M08L	_G 550/6_GT_	4/6	20%
	_G 750/6_GT_	5.5/6	20%

1.11 Cobertura de la garantía

ZENIT garantiza el funcionamiento del aparato de acuerdo con los parámetros de diseño siempre que se respeten los requisitos operativos indicados en la documentación del producto. La garantía de cada componente tiene una validez de doce meses a partir de la fecha de envío.
Zenit se compromete a reparar o sustituir el producto cuando las averías o desperfectos se deban a defectos de diseño, manufactura o montaje y siempre que se le comuniquen a Zenit durante el periodo de garantía.
La garantía no cubre las averías o desperfectos debidos a:

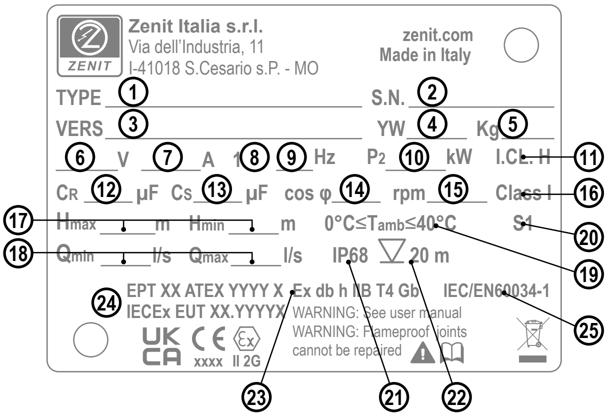
- desgaste normal;
- desplazamiento, instalación o uso no conformes;
- uso con sistemas de control que no estén conectados correctamente;
- intervenciones realizadas por personal no cualificado;
- uso de recambios no originales.

¡ATENCIÓN! Toda modificación aportada al producto sin la autorización del fabricante puede causar situaciones de peligro y provocar una reducción del rendimiento y la invalidación de la garantía.

1.12 Placa de datos (Fig. 3A, 3B)

En la tapa del motor hay una placa metálica en la que aparecen los datos y las certificaciones relativos a la bomba.
Junto con este manual, se ha entregado una etiqueta adhesiva plateada que lleva impresas las mismas características del producto que se encuentran en la placa metálica fijada en la bomba. Se aconseja colocar dicha etiqueta en el espacio que le corresponde en el interior del manual y consultar los datos contenidos en ella para toda solicitud o información que se necesite.

Monofásica


Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE
S.N.
VERS
YW
Kg
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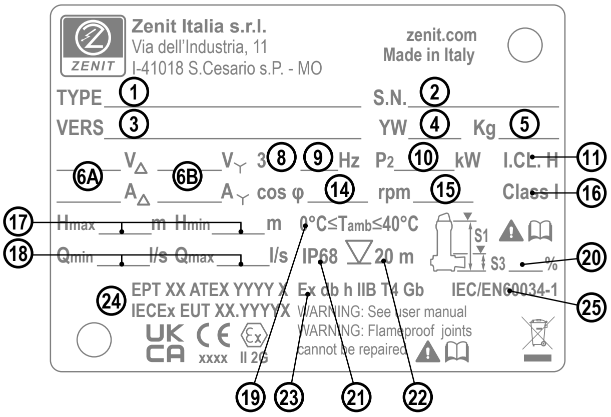
3A

Trifásica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I-41018 S.Cesario s.P. - MO
zenit.com
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IECEx EUT XX.YYYYX
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WARNING: Flameproof joints cannot be repaired
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3B

1. Nombre del producto
2. Número de serie
3. Versión
4. Año y semana de fabricación
5. Peso
6. Tensión nominal
6A. Tensión y corriente *(conexión triángulo)*
6B. Tensión y corriente *(conexión estrella)*
7. Corriente nominal
8. Fases
9. Frecuencia
10. Potencia del motor P2
11. Clase de aislamiento del motor
12. Condensador de marcha
13. Condensador de arranque
14. Factor de potencia
15. Velocidad *(rpm)*
16. Clase de protección IEC contra descargas eléctricas
17. Altura mínima y máxima
18. Caudal mínimo y máximo
19. Temperatura ambiente
20. Servicio
21. Código IP *(grado de protección de la carcasa)*
22. Profundidad máxima de inmersión
23. Marcado ATEX y/o IECEx *(solo modelos -Ex)*
24. Número de certificado ATEX e IECEx *(solo modelos -Ex)*
25. Normas de referencia para el motor

1.13 Significado del marcado -Ex

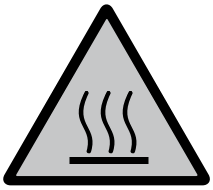
CE XXXX

Marcado CE de conformidad con la Directiva ATEX 2014/34/UE
XXXX indica el número del organismo notificado (indicado en la placa de datos) que ha certificado el sistema de calidad para ATEX

Marcado -Ex	
⟨Ex⟩ II 2G *(solo ATEX)*	Ex db h IIB T4 Gb

Símbolo	Significado
⟨Ex⟩	Marcado específico de protección contra las explosiones según el Anexo II de la Directiva ATEX 2014/34/UE
II	Grupo del aparato. Grupo II: aparatos eléctricos para uso en atmósferas potencialmente explosivas debidas a la presencia de gases, distintos a la minería.
2G	Categoría del aparato descrito en el certificado para atmósferas potencialmente explosivas debidas a la presencia de gases, vapores y nieblas (G). El aparato se puede instalar en una Zona 1.
Ex db h IIB	El modo de protección de equipos eléctricos utilizado en el aparato es la protección por envolvente antideflagrante «db» - adecuado para gases del grupo IIB y IIA. El modo de protección de equipos mecánicos (no eléctricos) utilizado en el aparato es la inmersión en líquido «k» y la seguridad constructiva «c» - adecuado para gases del grupo IIB y IIA.
T4	Clase de temperatura del aparato (temperatura superficial máxima 135 °C).
Gb	Aparato con «alto» nivel de protección (EPL Gb), adecuado para el uso en una Zona 1.

1.14 Etiquetas adhesivas aplicadas al producto



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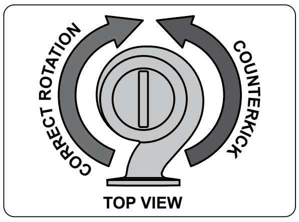
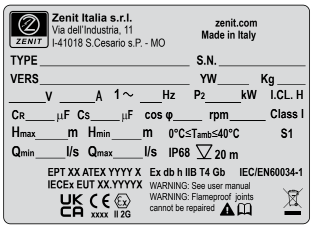

CORRECT ROTATION
COUNTERKICK
TOP VIEW

5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6

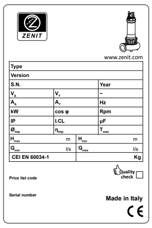
ZENIT
www.zenit.com
Made in Italy

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Fig. 4. Etiqueta de identificación de las superficies que presentan riesgo de sobrecalentamiento.
Fig. 5. Etiqueta de identificación del sentido de giro correcto de la turbina (vista desde arriba).
Fig. 6. Etiqueta plateada. Reproduce la placa de datos aplicada al producto; debe colocarse en el espacio correspondiente de este manual y es preciso consultarla para toda solicitud o información que se necesite.
Fig. 7. Etiqueta aplicada al embalaje del producto.

2. TRANSPORTE Y ALMACENAMIENTO

2.1 Control visual

Compruebe visualmente que el embalaje no esté dañado. Retire el material de embalaje y deséchelo de conformidad con la normativa vigente. Tenga cuidado de no hacerse daño con herramientas cortantes y de no dañar el producto, especialmente los cables eléctricos.
Inspeccione el producto para asegurarse de que no haya piezas dañadas o que faltan. Si falta algún artículo, póngase en contacto con Zenit (o su distribuidor) o con la empresa transportista.
Compruebe que los datos que aparecen en la placa coinciden con los del producto solicitado.

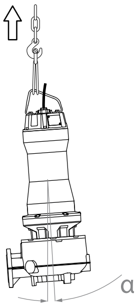
2.2 Desplazamiento y elevación

La máquina debe elevarse y desplazarse mediante una cadena o una correa fijada al puño superior, utilizando un medio mecánico idóneo (grúa, polipasto, etc.).
Antes de elevarla, tome nota del peso del producto (indicado en la placa) y utilice correas, cadenas y ganchos certificados que tengan la capacidad adecuada.
Compruebe que la electrobomba esté enganchada de forma segura y que no pueda caerse, rodar u oscilar.
El puño superior ha sido diseñado para garantizar que la electrobomba permanezca equilibrada durante la elevación; sin embargo, la máquina puede oscilar al separarse del suelo **(Fig. 8).**
Se desaconseja vivamente el permanecer en las inmediaciones de la electrobomba durante su desplazamiento.
Lleve siempre los equipos de protección individual.

¡ATENCIÓN! Antes de elevar la bomba, asegúrese de que se respeta la normativa local acerca de los límites de peso de los objetos desplazados manualmente, es decir, sin la ayuda de aparatos de elevación.

¡ATENCIÓN! NO utilice NUNCA los cables eléctricos de alimentación ni de señales para mover el producto.

Cerciórese de que la atmósfera de la zona de trabajo no sea potencialmente explosiva. La clasificación del lugar de instalación deberá ser definida por el propietario.



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2.3 Almacenamiento

Durante el periodo de almacenamiento, la electrobomba debe guardarse dentro de su embalaje en un lugar idóneo, fuera del alcance de los niños o personas no responsables, protegida de forma adecuada contra las caídas accidentales y la humedad, las vibraciones, el polvo y las temperaturas extremas (inferiores a -20 °C/-4 °F y superiores a +60 °C/140 °F).

¡ATENCIÓN! Si la electrobomba se congela, no use llamas para derretir el hielo; sumérjala en el líquido en el que se va a instalar hasta que se descongele.

Compruebe el estado del aceite de los cierres mecánicos antes de usar el producto si ha estado expuesto a bajas temperaturas.

¡ATENCIÓN! De vez en cuando (por lo menos una vez cada dos meses), gire la turbina para evitar que los cierres mecánicos se peguen unos a otros.

3. INSTALACIÓN

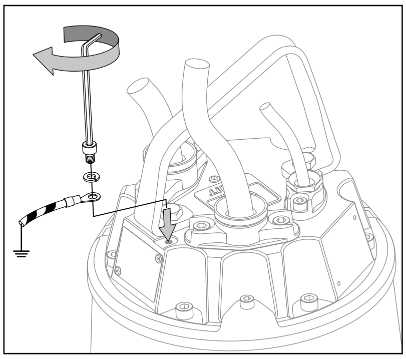
3.1 Advertencias generales de seguridad

- Delimite la zona de trabajo de forma adecuada y utilice siempre los equipos de protección individual.
- Antes de realizar toda operación, asegúrese de que la electrobomba y el cuadro eléctrico estén aislados de la red y que no puedan ponerse bajo tensión de forma accidental.
- Compruebe la integridad del cable eléctrico y de las juntas y asegúrese de que la turbina gire libremente.
- Las dimensiones del depósito en el que se instala la electrobomba deben:
  - permitir que los reguladores de nivel de flotador se muevan libremente (si están instalados);
  - evitar que el número de ciclos de encendido/apagado de la electrobomba supere el valor permitido (indicado en la ficha técnica).
- La electrobomba se debe introducir en el depósito mediante una correa o una cadena de capacidad adecuada, enganchada en el puño.
- Antes de la instalación, compruebe que el fondo del depósito sea plano.
- Para evitar problemas de cavitación debidos a la aspiración de aire, asegúrese de que los líquidos no entren en el depósito cerca de la electrobomba o que su flujo se dirija hacia ella.
- Asegúrese de que la electrobomba no trabaje fuera de su curva característica.

Cerciórese de que la atmósfera de la zona de trabajo no sea potencialmente explosiva. Las personas no deberán acceder a la zona de instalación si la atmósfera es explosiva. La clasificación del lugar de instalación deberá ser aprobada, caso por caso, por las autoridades de protección contra incendios de cada país.

La descarga de las cargas electrostáticas acumuladas en componentes aislados puede provocar explosiones.
Las electrobombas Ex no presentan componentes aislados que pueden cargarse de electricidad estática y todas están equipadas con un tornillo de conexión a la red equipotencial de tierra (Fig. 9).
Todo componente adicional instalado en la zona de riesgo deberá conectarse a la red de tierra, de conformidad con la norma EN 1127-1.
Compruebe que todos los componentes adicionales instalados en la zona de riesgo sean idóneos para el uso en atmósferas potencialmente explosivas.

Antes de la instalación, compruebe el nivel de aceite en la cámara de aceite de los cierres mecánicos.



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3.2 Comprobación del sentido de giro de la turbina

Antes de efectuar la conexión eléctrica definitiva, un técnico cualificado debe comprobar que la turbina gire en el sentido correcto.
La electrobomba lleva una etiqueta adhesiva que indica el sentido de giro que debe tener la turbina (flecha verde) y la dirección del golpe de retroceso (flecha roja) cuando la electrobomba se ve desde arriba **(Fig. 5).**

Todas las operaciones siguientes deben realizarse en un lugar seguro, donde no exista una atmósfera potencialmente explosiva.

Siga este procedimiento:
1. Coloque la electrobomba en vertical, apoyándola en los pies de soporte o en la base.
2. Fije la electrobomba con una cadena o una correa de tamaño adecuado, enganchada al puño superior para evitar posibles caídas accidentales causadas por el golpe de retroceso.

¡ATENCIÓN! El golpe de retroceso puede ser muy fuerte. No permanezca en las inmediaciones de la electrobomba durante el procedimiento.

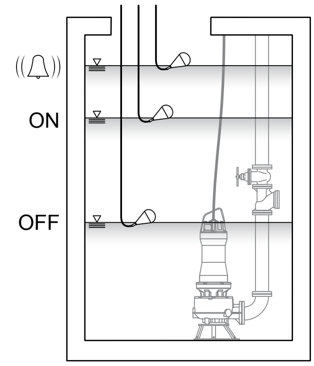
3. Conecte de forma provisional el conductor amarillo-verde a la toma de tierra y, a continuación, los cables de alimentación al telerruptor.
4. Aleje a las personas y los objetos de la electrobomba a una distancia de 2 metros como mínimo.
5. Accione el interruptor de marcha, alimente la electrobomba durante unos segundos y, a continuación, pulse el interruptor de parada para interrumpir la alimentación.
6. Compruebe que el sentido de giro sea correcto.

Si la turbina gira en sentido contrario, invierta la conexión de dos de las tres fases de alimentación de la electrobomba en el cuadro y vuelva a comprobarlo, repitiendo el procedimiento descrito.
Una vez hallada la conexión que le corresponde al sentido de giro correcto, MARQUE la secuencia exacta de conexión de los cables con el cuadro, DESCONECTE los cables de alimentación de la electrobomba y realice la instalación definitiva.

¡ATENCIÓN! Si hay varias electrobombas conectadas a un solo cuadro eléctrico, el control del sentido de giro debe realizarse por separado para cada unidad instalada.

3.3 Instalación del sistema de control mediante flotadores

Los flotadores permiten comprobar el arranque y la parada de una o varias electrobombas según el nivel de líquido que se alcanza en el depósito.
Además, se pueden conectar a dispositivos de alarma para evitar que se produzcan condiciones anómalas (rebosamiento o funcionamiento en seco) **(Fig. 10).**
Deben instalarse lejos de remolinos o caídas de agua.
Si se producen fuertes turbulencias, es recomendable fijar los flotadores a una vara rígida colocada en el interior del pozo.
Asegúrese de que no haya objetos que puedan obstaculizar el movimiento de los flotadores, que los cables no interfieran entre sí y que no puedan enredarse o engancharse en salientes del interior del depósito.
Los flotadores deben estar instalados de forma que se garantice el nivel mínimo correcto del líquido.



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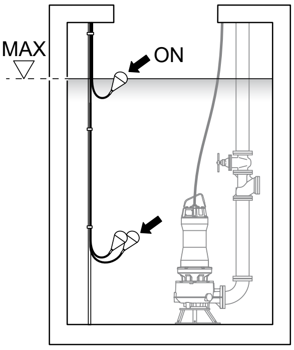
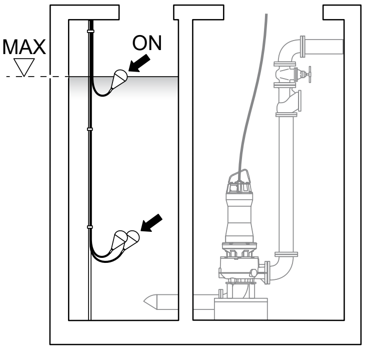
El nivel mínimo de líquido se controlará mediante dos interruptores de flotador (redundantes) para interrumpir la alimentación cuando el líquido alcance el nivel mínimo (bomba completamente sumergida).
Utilice únicamente interruptores de flotador adecuados para la clasificación -Ex del lugar de instalación.
La conexión con el cuadro eléctrico se debe realizar utilizando una interfaz de seguridad intrínseca como las barreras Zener o las barreras de separación galvánica.

Asegúrese de que la conmutación **de parado a marcha**
se produzca única y exclusivamente cuando flotadores se encuentran en la posición representada en las **Figs. 11A, 11B, 11C.**
Asegúrese de que la conmutación **de marcha a parado**
se produzca única y exclusivamente cuando flotadores se encuentran en la posición representada en las **Figs. 12A, 12B, 12C.**
La conexión eléctrica de los flotadores debe realizarse de forma que garantice la parada de la bomba en caso de funcionamiento incorrecto de los flotadores.

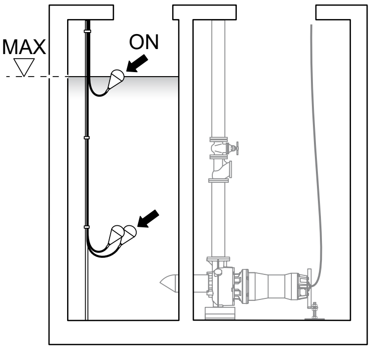
Asegúrese de que el volumen de líquido efectivo del depósito no disminuya tanto que el número de arranques por hora supere el máximo permitido.



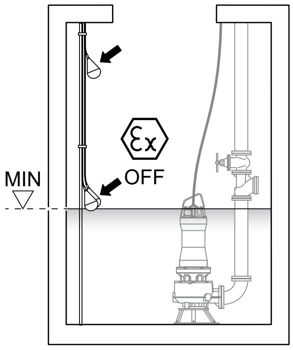
11 A



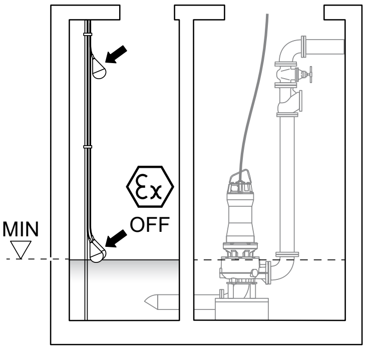
11 B



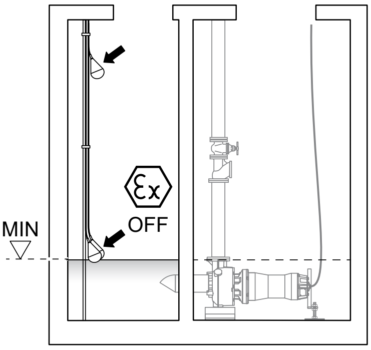
11 C



12 A



12 B



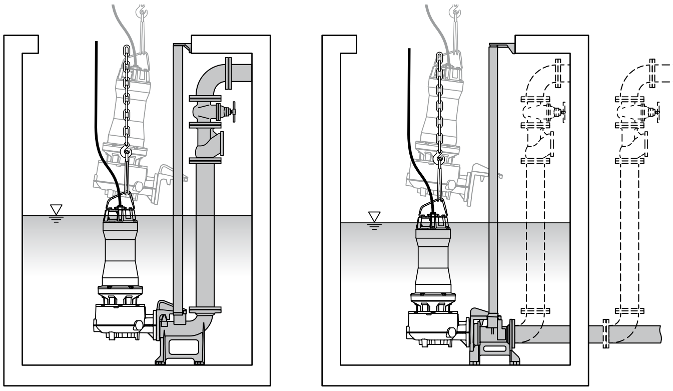
12 C

3.4 Tipos de instalación permitidos

Cerciórese de que la atmósfera de la zona de trabajo no sea potencialmente explosiva.

3.4.1 Instalación con dispositivo de acoplamiento DAC

Este tipo de instalación **(Fig. 13)** permite extraer la electrobomba del depósito y volver a colocarla de forma rápida, sin necesidad de hacer operaciones en el sistema.



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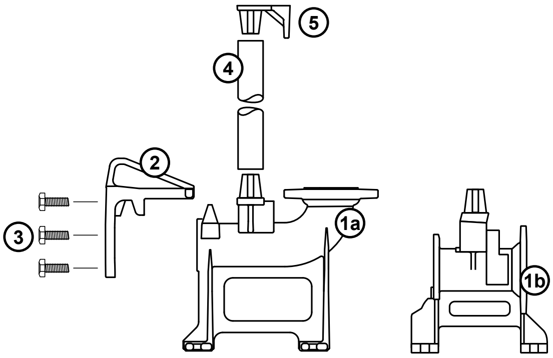
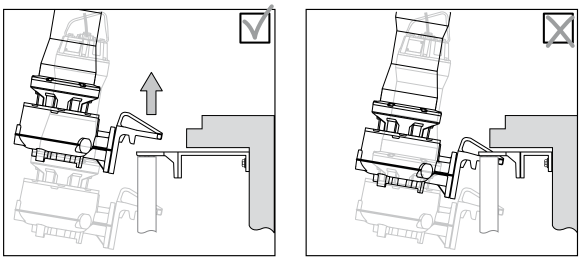


1a. Dispositivo de acoplamiento DAC V (salida vertical)
1b. Dispositivo de acoplamiento DAC H (salida horizontal)
2. Brida de acoplamiento
3. Tornillos
4. Tubos guía (no incluidos)
5. Elemento fijador separador

Procedimiento de instalación (Apéndice 1, pág. 130)

1. Asegúrese de que la electrobomba esté desconectada de la red de alimentación y de que el sentido de giro de la turbina sea correcto, siguiendo el procedimiento descrito en el manual.
2. Fije la brida en la boca de salida de la electrobomba, mediante los tornillos incluidos. Para los modelos con gancho, fije el gancho al cuerpo de la bomba mediante los tornillos incluidos.
3. Coloque el dispositivo de acoplamiento en el fondo del depósito y marque la posición de los orificios de fijación.
4. Realice orificios de diámetro adecuado para las ranuras de fijación del dispositivo de acoplamiento y fíjelo de forma estable en el fondo del depósito mediante tacos químicos o de expansión. Utilice tornillos de acero inoxidable o proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión.
5. Conecte el tubo de salida al dispositivo de acoplamiento. Se recomienda instalar una compuerta de interceptación y una válvula de retención de bola de paso libre integral, utilizando un tubo de unión que mida de largo al menos 5 veces el diámetro de la boca de salida.
6. Acople los tubos guía cortados a medida en el dispositivo de acoplamiento. Puede utilizar tubos de hierro zincado o, preferiblemente, de acero inoxidable que tengan el diámetro adecuado (véase la ficha técnica).
7. Acople el elemento fijador separador en el extremo superior de los tubos guía y marque la posición de los orificios para fijarlo a una de las paredes del depósito. Asegúrese de que los tubos guía estén perfectamente verticales, utilizando una plomada o un nivel de burbuja.

¡ATENCIÓN! Antes de fijar el elemento fijador separador, asegúrese de que, al elevar la electrobomba, la brida de acoplamiento pueda extraerse completamente de los tubos guía (Fig. 14).



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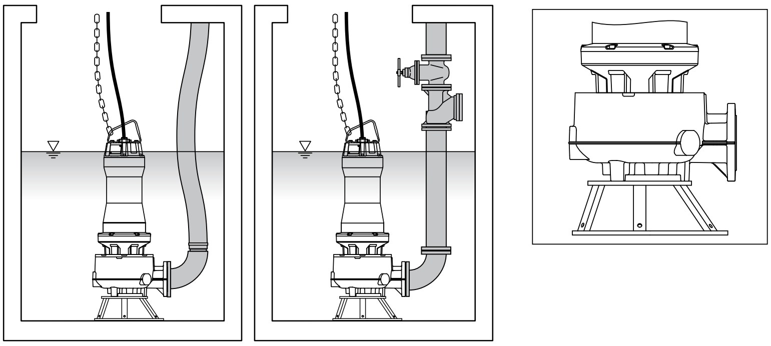
8. Realice orificios de diámetro adecuado para las ranuras de fijación del elemento fijador separador y fíjelo de forma estable mediante tacos químicos o de expansión. Proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión.
9. Limpie todo residuo y sedimento del depósito.
10. Fije en el puño una cadena o correa de capacidad adecuada e introduzca la electrobomba en el depósito deslizando la brida a lo largo de los tubos guía hasta que se una con el dispositivo de acoplamiento.
11. Fije los cables eléctricos de forma que no se retuerzan ni sufran tirones y que no puedan ser aspirados por la electrobomba.
12. Los cables eléctricos deben salir del depósito a través de un conducto limpio y libre de asperezas. Evite que el cable se doble formando curvas muy pronunciadas y que pueda aplastarse o dañarse.
13. Conecte los cables eléctricos en el cuadro de control.

3.4.2 Instalación móvil

En la instalación móvil **(Fig. 15)**, la electrobomba se fija a una base específica que la mantiene en posición vertical en el fondo del depósito y garantiza la altura correcta de la boca de aspiración.



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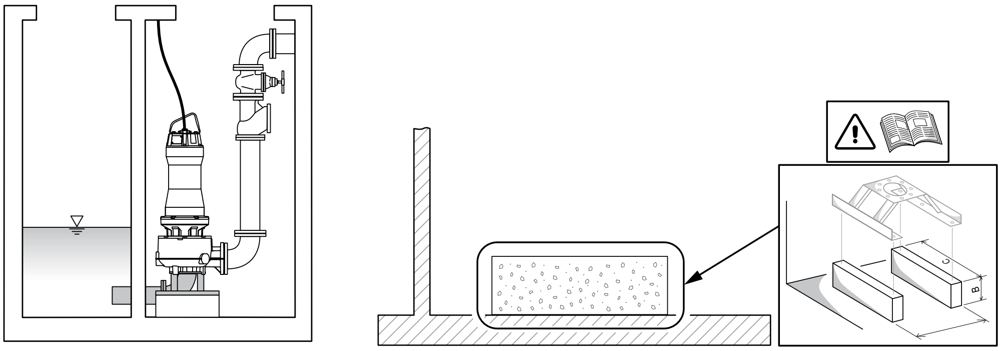
Procedimiento de instalación (Apéndice 2, pág. 131)
1. Asegúrese de que la electrobomba esté desconectada de la red de alimentación y de que el sentido de giro de la turbina sea correcto, siguiendo el procedimiento descrito en el manual.
2. Baje la electrobomba hasta la base utilizando una cadena o correa de capacidad adecuada, fijada al puño. Asegúrese de que no pueda caerse ni oscilar.
3. Fije la electrobomba a la base mediante los tornillos incluidos.
4. Conecte la boca de salida a los tubos mediante la brida unificada. Utilice tornillos de acero inoxidable o proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión. Se recomienda instalar una compuerta de interceptación y una válvula de retención de bola de paso libre integral, utilizando un tubo de unión que mida de largo al menos 5 veces el diámetro de la boca de salida.
5. Si los tubos son de tipo flexible, utilice un racor portatubo con brida. Utilice preferiblemente un tubo con refuerzo en espiral o de tipo semirrígido para garantizar que el paso libre permanezca constante, incluso en curvas o cambios de dirección. Fije el tubo al racor mediante una abrazadera metálica.
6. Introduzca la electrobomba en el depósito hasta que se apoye de forma estable en el fondo, utilizando una cadena o correa de capacidad adecuada, fijada al puño. Asegúrese de que la electrobomba no pueda caerse ni oscilar.
7. Fije los cables eléctricos de forma que no se retuerzan ni sufran tirones y que no puedan ser aspirados por la electrobomba.
8. Los cables eléctricos deben salir del depósito a través de un conducto limpio y libre de asperezas. Evite que el cable se doble formando curvas muy pronunciadas y que pueda aplastarse o dañarse.
9. Conecte los cables eléctricos en el cuadro de control.

3.4.3 Instalación vertical en cámara en seco

Para la instalación vertical en cámara en seco **(Fig. 16)**, la electrobomba se equipa bajo pedido con una brida de aspiración preparada para la fijación de una base curvada (KBC).



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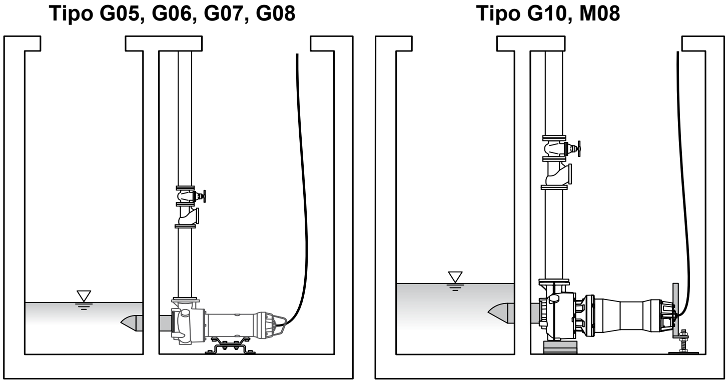
Procedimiento de instalación (Apéndice 3, pág. 132)
1. En el fondo del depósito, realice dos soportes de material adecuado para sostener el peso y las solicitaciones de la electrobomba (cemento, hormigón, albañilería, etc.) con el fin de colocar la boca de aspiración a la altura correcta. Las dimensiones recomendadas se indican en la ficha técnica.
2. Asegúrese de que la electrobomba esté desconectada de la red de alimentación y de que el sentido de giro de la turbina sea correcto, siguiendo el procedimiento descrito en el manual.
3. Coloque la electrobomba en la base y afiáncela mediante los tornillos de fijación.
4. Conecte la curva con brida a la boca de aspiración de la electrobomba mediante los tornillos de fijación. Si es necesario, tumbe la electrobomba y fíjela para impedir que se mueva accidentalmente.
5. Fije una cadena o correa de capacidad adecuada en el puño de la electrobomba e introduzca esta última en el depósito, colocando la base sobre los soportes del fondo del depósito.
6. Marque la posición de los orificios de fijación.
7. Realice orificios de diámetro adecuado para las ranuras de fijación de la base.

8. Fije la base de forma estable en los dos soportes mediante tacos químicos o de expansión. Utilice tornillos de acero inoxidable o proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión.
9. Conecte el tubo de aspiración a la curva con brida.
10. Conecte el tubo de salida a la electrobomba. Se recomienda instalar una compuerta de interceptación y una válvula de retención de bola de paso libre integral, utilizando un tubo de unión que mida de largo al menos 5 veces el diámetro de la boca de salida.
11. Limpie todo residuo y sedimento del depósito.
12. Fije los cables eléctricos de forma que no se retuerzan ni sufran tirones.
13. Los cables eléctricos deben salir del depósito a través de un conducto limpio y libre de asperezas. Evite que el cable se doble formando curvas muy pronunciadas y que pueda aplastarse o dañarse.
14. Conecte los cables eléctricos en el cuadro de control.

3.4.4 Instalación horizontal en cámara en seco

Para la instalación horizontal **(Fig. 17)**, la electrobomba está preparada para fijarse a una estructura de soporte de carpintería metálica (KBS-H).



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Procedimiento de instalación (tipo G05, G06, G07, G08) (Apéndice 4, pág. 133)

1. Asegúrese de que la electrobomba esté desconectada de la red de alimentación y de que el sentido de giro de la turbina sea correcto, siguiendo el procedimiento descrito en el manual.
2. Fije el elemento fijador inferior al fondo del depósito. Utilice tornillos de acero inoxidable o proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión.
3. Fije el elemento fijador superior a la bomba.
4. Coloque la bomba en horizontal situando el elemento fijador superior sobre el inferior.
5. Una firmemente los elementos fijadores uno a otro con los tornillos.
6. Conecte los tubos de aspiración y de salida. Se recomienda instalar una compuerta de interceptación y una válvula de retención de bola de paso libre integral, utilizando un tubo de unión que mida de largo al menos 5 veces el diámetro de la boca de salida.
7. Limpie todo residuo y sedimento del depósito.
8. Fije los cables eléctricos de forma que no se retuerzan ni sufran tirones.
9. Los cables eléctricos deben salir del depósito a través de un conducto limpio y libre de asperezas. Evite que el cable se doble formando curvas muy pronunciadas y que pueda aplastarse o dañarse.
10. Conecte los cables eléctricos en el cuadro de control.

Procedimiento de instalación (tipo G10, M08) (Apéndice 4, pág. 133)

1. Asegúrese de que la electrobomba esté desconectada de la red de alimentación y de que el sentido de giro de la turbina sea correcto, siguiendo el procedimiento descrito en el manual.
2. Coloque la electrobomba en vertical sobre una superficie uniforme y estable.
3. Desatornille los tornillos que bloquean el puño de elevación (si está instalado) y retírelo. Alternativamente, desatornille y retire los cáncamos.
4. Fije el elemento fijador superior a la tapa del motor de la electrobomba. Tenga cuidado de no dañar los cables eléctricos.
5. Fije el separador en el elemento fijador superior sin apretar las tuercas de fijación.
6. Fije el elemento fijador inferior al cuerpo de la bomba.
7. Utilizando una plomada, ajuste la posición del separador de forma que su placa de apoyo se halle en el mismo plano que la del elemento fijador inferior. Apriete las tuercas del separador.
8. Coloque la electrobomba en la posición correcta utilizando un medio mecánico idóneo (grúa, polipasto). Para elevarla, utilice una cadena o correa de capacidad adecuada para el peso de la electrobomba. Tenga cuidado, porque la electrobomba puede oscilar al separarse del suelo.
9. Fije el sistema de forma estable en el fondo del depósito utilizando tacos químicos o de expansión. Utilice tornillos de acero inoxidable o proteja los tornillos y las tuercas con un producto idóneo para prevenir la corrosión.
10. Conecte los tubos de aspiración y de salida. Se recomienda instalar una compuerta de interceptación y una válvula de retención de bola de paso libre integral, utilizando un tubo de unión que mida de largo al menos 5 veces el diámetro de la boca de salida.
11. Limpie todo residuo y sedimento del depósito.
12. Fije los cables eléctricos de forma que no se retuerzan ni sufran tirones.
13. Los cables eléctricos deben salir del depósito a través de un conducto limpio y libre de asperezas. Evite que el cable se doble formando curvas muy pronunciadas y que pueda aplastarse o dañarse.
14. Conecte los cables eléctricos en el cuadro de control.

4. CONEXIONES ELÉCTRICAS

4.1 Advertencias generales de seguridad

Todas las operaciones de conexión a la red eléctrica deben realizarse por personal cualificado, de conformidad con la normativa vigente. Las conexiones eléctricas que no se realizan correctamente pueden provocar incendios, riesgo de choque eléctrico y daños al producto.

- Asegúrese de que los conductores no utilizados estén aislados de forma apropiada y fijados en el interior del cuadro eléctrico.
- Antes de instalar el equipo, asegúrese de que la tensión y la frecuencia de la línea de alimentación coincidan con las que se indican en la placa de datos y que la absorción sea inferior a la corriente máxima que puede proporcionar el sistema.
- La máxima variación que se permite en el valor de la tensión nominal de la placa es de ±5 %.
- Desequilibrio de tensión permitido entre fases: máx. 2 %
- Los fusibles y los interruptores de protección deben tener una capacidad compatible con las características de la instalación.
- Para proteger el motor de la electrobomba, utilice un interruptor de sobrecarga adecuado para las características eléctricas indicadas en la placa de datos.
- Asegúrese de que las protecciones térmicas siempre estén conectadas correctamente: si la protección térmica no está conectada, se produce una situación de peligro, además de invalidarse la garantía.
- El funcionamiento y la seguridad eléctrica de las electrobombas de ZENIT están garantizados en la configuración de fábrica: toda modificación (p. ej., añadir un trozo de cable al original) puede degradar las características de la electrobomba.

Antes de la instalación y de la primera puesta en servicio, asegúrese de que los cables eléctricos no presenten ningún daño, para evitar cortocircuitos.

4.2 Cables

- Asegúrese de que los cables eléctricos no presenten ningún daño y que los extremos no estén expuestos a la humedad o sumergidos en agua.
- Los terminales libres del cable deben estar conectados a un cuadro eléctrico homologado que disponga de un grado de aislamiento idóneo para el entorno en el que se instala.
- Fije los cables eléctricos de forma que no se retuerzan, sufran tirones o se aplasten.
- Si el cable está dañado, no lo sustituya: póngase en contacto con Zenit o un centro de asistencia autorizado.
- No subestime los problemas relacionados con las caídas de tensión.

Los terminales libres del cable de alimentación deben estar conectados a un cuadro eléctrico certificado para atmósferas potencialmente explosivas, si está instalado en la zona de riesgo.

4.3 Puesta a tierra

- Asegúrese de disponer de una instalación de puesta a tierra y un interruptor diferencial eficaces.
- Asegúrese de que el conductor de tierra mida unos 150 mm más que los demás conductores, de forma que sea el último en desconectarse del cuadro en caso de producirse un tirón accidental.

La conexión predispuesta para el conductor de tierra externo admite cables con una sección transversal mínima de 4 mm².

No conecte el cable de tierra a tuberías de gas o de agua, a pararrayos ni a cables telefónicos.
Una puesta a tierra incorrecta puede provocar descargas eléctricas.

En los modelos -Ex, asegúrese de que haya un conductor de tierra externo (amarillo/verde, con una sección transversal mínima de 4 mm²) conectado con el terminal de tierra externo de la bomba por medio de un fijacable seguro.
Limpie la superficie de la conexión de puesta a tierra externa antes de montar el fijacable.

4.4 Protección térmica

La bomba está equipada con protecciones térmicas en el interior de los arrollamientos del estator para interrumpir la alimentación en caso de sobrecalentamiento del motor.
La protección térmica de serie consiste en protectores térmicos bimetálicos con una temperatura de conmutación nominal NST de 150 °C; como opción, es posible sustituir los protectores bimetálicos por termistores PTC o sensores PT100.
Los cables de la protección térmica están marcados con una etiqueta que lleva escrito «TP» (THERMAL PROTECTION, es decir, protección térmica) y deben conectarse a los bornes correspondientes en el cuadro eléctrico.

Es obligatorio conectar los protectores térmicos a un cuadro eléctrico. La configuración del cuadro eléctrico debe garantizar la parada del motor en caso de activación de la protección térmica interna y debe evitar el rearranque automático de la electrobomba, el cual deberá producirse solo mediante la intervención manual del operador tras solucionar las causas de la anomalía.

4.5 Sonda de humedad

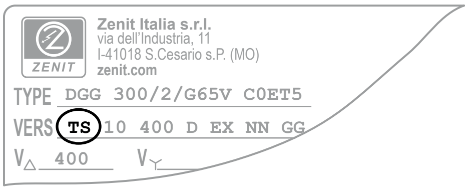
La electrobomba se puede equipar con una sonda de humedad de un solo electrodo como accesorio para la detección y el señalamiento de infiltraciones de agua en la cámara de aceite de los cierres mecánicos (el conductor de tierra se utiliza como camino de retorno para la señal de detección de presencia de agua en la cámara de aceite).
En caso de señalamiento, ponga la bomba fuera de servicio y realice las operaciones de mantenimiento.
El cable de señal está marcado con una etiqueta que lleva la letra **S.**

Para las instalaciones con modelos certificados -Ex, la conexión con el cuadro eléctrico deberá realizarse introduciendo una barrera de seguridad intrínseca con aislamiento galvánico en la zona segura.

Datos eléctricos relativos a la seguridad para el sensor de seguridad intrínseca:

Sonda U_i: 30 V; I_i: 120 mA; P_i: 1,3 W
C_i: 0,3 nF; L_i: ~ 0 mH
Cable C_c: 200 pF/m; L_c: 1 μH/m; L_c/R_c= 30 μH/Ω

4.6 Conexión eléctrica


Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
ZENIT
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⅄

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Para realizar la conexión eléctrica de la electrobomba, siga este procedimiento:

1. Consulte la placa de datos para averiguar el tipo de conexión eléctrica necesaria (campo VERS) **(fig. 18)**.
2. Conecte el conductor de tierra con el borne correspondiente del cuadro eléctrico, siguiendo el esquema de conexión.
3. Conecte los cables de alimentación con los bornes correspondientes del cuadro eléctrico, siguiendo los esquemas de conexión.
4. Conecte los conductores de los dispositivos de control a los bornes correspondientes del cuadro eléctrico.

Nota. Observe atentamente las conexiones indicadas en los esquemas de conexión.
Consulte la documentación específica proporcionada con la bomba para mayor información sobre las conexiones eléctricas de los sensores y los dispositivos de protección no estándares.

LOS ESQUEMAS DE CONEXIÓN SE ENCUENTRAN EN LA PÁGINA 123.

5. PUESTA EN SERVICIO

¡ATENCIÓN! Antes de realizar toda operación, asegúrese de que la electrobomba y el cuadro eléctrico estén desconectados del sistema eléctrico y que no puedan ponerse en marcha de forma accidental.

Antes de poner en marcha la bomba, compruebe:

- que haya aceite en la cámara de los cierres mecánicos (véase el apartado 6.5.3);
- que la turbina gire libremente;
- que el aparato esté instalado de forma correcta y estable;
- que los dispositivos de supervisión instalados estén conectados correctamente.

5.1 Advertencias generales de seguridad

- Todas las operaciones deben ser realizadas por personal técnico competente.
- La electrobomba siempre se debe utilizar con los dispositivos de seguridad instalados y en estado eficiente.
- Mantenga los objetos y las personas a distancia de seguridad con respecto a las máquinas instaladas e impida que las personas y los animales entren en contacto con el líquido en el que están sumergidas.
- Asegúrese de que la turbina gire correctamente, siguiendo el procedimiento descrito en el manual.

5.2 Arranque

No se debe poner en marcha la bomba si la atmósfera en el depósito es potencialmente explosiva.

Una vez terminada la instalación, es oportuno realizar una puesta a punto del sistema para verificar que funciona perfectamente.
La bomba siempre se debe utilizar con los dispositivos de seguridad instalados y en estado eficiente. Compruebe que todos los dispositivos de seguridad se hayan conectado correctamente.
La bomba no debe funcionar en seco; compruebe que el nivel del líquido esté por encima del motor.
Compruebe que las válvulas de compuerta estén abiertas, si están instaladas.
Encienda la alimentación eléctrica y deje funcionar la bomba durante unos instantes con el fin de:

- verificar que la corriente absorbida respete el límite indicado en la placa de datos;
- comprobar que los sistemas de supervisión funcionen correctamente (ninguna alarma ni aviso);
- comprobar que la configuración de los niveles de encendido y apagado (nivel mínimo y máximo) sea correcta.

¡ATENCIÓN! El número máximo de arranques por hora permitidos deberá respetarse para evitar que se dañe el motor.

¡ATENCIÓN! En caso de producirse ruidos anómalos o vibraciones en la bomba, averías, alarmas o advertencias, detenga inmediatamente la bomba y no vuelva a ponerla en marcha hasta que haya localizado y solucionado la causa de las anomalías.

5.3 Nivel de presión acústica

El nivel de presión acústica de la electrobomba cuando está en marcha es inferior a 70 dB.
Sin embargo, en algunas instalaciones y en algunos puntos de trabajo en la curva de prestaciones, se puede superar este límite.
Compruebe cuál es el nivel de presión acústica permitido en el entorno en que se instala el producto, para no incumplir ninguna norma del país de uso.

6. MANTENIMIENTO Y ASISTENCIA

6.1 Preámbulo

Es imprescindible realizar el mantenimiento regular y las inspecciones periódicas para mantener intacto el rendimiento de la bomba. Por eso, hay que limpiar, revisar e inspeccionar el sistema a intervalos regulares.
Si la bomba empieza a comportarse de forma distinta a las condiciones de funcionamiento habituales, consulte el capítulo «7. Guía de solución de problemas» de este manual y tome prontamente las medidas necesarias para solucionar la anomalía.

¡ATENCIÓN! Las instrucciones relacionadas con el control y el mantenimiento de estas bombas no deben considerarse como intervenciones de tipo «hágalo usted mismo», sino que requieren conocimientos técnicos específicos.
NOTA. Para realizar el control y la sustitución de los componentes, se requieren herramientas específicas.
Si necesita efectuar estas operaciones, póngase en contacto con el vendedor del producto o con la oficina de ventas de ZENIT de su zona.

Las comprobaciones y reparaciones de los aparatos -Ex deben llevarse a cabo de conformidad con las siguientes normas:

- **EN 60079-17: Atmósferas explosivas. Parte 17: Inspección y mantenimiento de instalaciones eléctricas**
- **IEC 60034-23: Máquinas eléctricas rotativas. Parte 23: Reparación, revisión y reclamación**
- **EN 60079-19: Atmósferas explosivas. Parte 19: Reparación, revisión y reconstrucción del equipo**

Las operaciones en las electrobombas en versión -Ex solo pueden ser realizadas por personal técnico cualificado en un centro de asistencia certificado -Ex (de conformidad con las normas internacionales y/o del país de uso) o bien por un centro de asistencia de Zenit, y para ello se utilizará únicamente recambios originales. El incumplimiento de esta disposición conllevará la pérdida de la certificación -Ex.

6.2 Advertencias generales de seguridad

- Antes de realizar cualquier operación en una bomba instalada en líquidos nocivos para la salud, limpie a fondo la bomba, el depósito, etc., de conformidad con las disposiciones del país de uso.
- Antes de efectuar operaciones de limpieza o mantenimiento, un técnico competente debe aislar la bomba, interrumpiendo la alimentación y asegurándose de que no pueda ponerse en marcha accidentalmente.
- Siempre deben desconectarse primero los conductores de las fases y después el conductor de tierra amarillo-verde.
- Asegúrese de que la bomba no pueda caerse ni rodar, para que no dañe los objetos o a las personas.
- Antes de realizar cualquier operación en la bomba, lave su superficie con abundante agua limpia y/o detergentes específicos.
- Tras un uso prolongado, la superficie de la bomba puede calentarse mucho: deje que se enfríe adecuadamente para evitar quemaduras.
- Observe siempre las normas de seguridad vigentes en el lugar donde se instala, toda norma local y lo que dicte el sentido común.

6.3 Mantenimiento programado y asistencia

La frecuencia con la que se realizan las operaciones de mantenimiento depende del tipo de instalación, la carga de trabajo a la que se somete la bomba y el tipo de líquido en el que está sumergida.

Durante el mantenimiento programado o toda vez que las prestaciones de la bomba disminuyan o que las vibraciones y el ruido aumenten (con respecto a los valores originales), habrá que realizar un control de las piezas sometidas a desgaste; para ello, póngase en contacto con un centro de asistencia autorizado.

<table>
<tr><th rowspan="2">Intervalo</th><th colspan="2">Tipo de comprobación</th></tr>
<tr><th>Modelo estándar</th><th>Modelo -Ex</th></tr>
<tr><td rowspan="2">Semanal</td><td colspan="2">Compruebe que la corriente absorbida respete el valor nominal.</td></tr>
<tr><td colspan="2">Compruebe que la tensión de alimentación se encuentre dentro de ±5 % del valor nominal.</td></tr>
<tr><td>Mensual</td><td colspan="2">Control de la bomba:
Si el rendimiento de la bomba disminuye de forma significativa, puede que la turbina esté obstruida o bloqueada por residuos. Retire los residuos y cambie las partes que se hayan dañado, si procede.
Control de los cables: véase el apartado 6.5.1 «Control de los cables eléctricos».
Medición de la resistencia de aislamiento: el valor de referencia de la resistencia de aislamiento = mín. 20 MΩ
<i>NOTA. Se deberá revisar el motor si el valor de la resistencia de aislamiento es notablemente inferior al valor detectado durante el control anterior.</i></td></tr>
<tr><td rowspan="5">Cada 6 meses o tras 3000 horas
(lo que antes ocurra)</td><td colspan="2">Control y limpieza de la cadena o cable de elevación:
- sustitúyalos en caso de daños, corrosión o desgaste;
- elimine todo cuerpo extraño, si procede.</td></tr>
<tr><td colspan="2">Compruebe si los cabrestantes, ganchos y cadenas presentan señales de desgaste, daños o corrosión. Límpielos y lubríquelos si es necesario y cambie los componentes dañados. Elimine todo cuerpo extraño que haya presente.</td></tr>
<tr><td colspan="2">Compruebe que los tornillos, tuercas y pernos estén apretados correctamente. Si hace falta, apriete los tornillos y cambie el fijador de roscas.</td></tr>
<tr><td colspan="2">Compruebe las fijaciones del fondo del depósito cada vez que se vacía.</td></tr>
<tr><td></td><td>Compruebe los cables, el aceite, los cierres mecánicos, los cojinetes, las piezas sujetas a desgaste (turbina, brida de aspiración, etc.).
Si hay agua presente en el aceite, compruebe los cierres mecánicos. Consulte el apartado 6.5.3 «Procedimiento de control y cambio del aceite».
<i>NOTA. Si debe desmontar la bomba durante el control, cambie siempre los componentes de goma (juntas tóricas, juntas).</i></td></tr>
<tr><td>Anual</td><td>Compruebe los cables, el aceite, los cierres mecánicos, los cojinetes, las piezas sujetas a desgaste (turbina, brida de aspiración, etc.).
Si hay agua presente en el aceite, compruebe los cierres mecánicos. Consulte el apartado 6.5.3 «Procedimiento de control y cambio del aceite».
<i>NOTA. Si debe desmontar la bomba durante el control, cambie siempre los componentes de goma (juntas tóricas, juntas).</i></td><td></td></tr>
<tr><td rowspan="3">Cada 2 años o bien tras 9000 horas
(lo que antes ocurra)</td><td colspan="2">Cambio del aceite
<i>NOTA. Consulte el apartado «Procedimiento de control y cambio del aceite» para más información.</i></td></tr>
<tr><td colspan="2">Sustitución de los cierres mecánicos
<i>NOTA. Para el control y la sustitución de los cierres mecánicos, se requieren herramientas específicas. Para llevar a cabo estas operaciones, póngase en contacto con el distribuidor donde compró el aparato o bien con un vendedor de su zona.</i></td></tr>
<tr><td></td><td>Sustitución de cojinetes.</td></tr>
<tr><td>Una vez cada 2-5 años</td><td colspan="2">Revisión:
La bomba se debe revisar aunque funcione correctamente. Más específicamente, podría ser necesario anticipar la revisión si la bomba se utiliza en modo continuo.</td></tr>
</table>

6.4 Limpieza

Elimine los residuos de la superficie de la bomba y lávela con agua corriente. Si la parte hidráulica está obstruida, límpiela minuciosamente. Preste especial atención a la parte hidráulica y elimine completamente todo residuo que haya presente.

Si la bomba se utiliza en aplicaciones ocasionales, tras cada uso es necesario lavar la parte hidráulica para evitar que se formen incrustaciones. Para ello, haga que la máquina realice varios ciclos de bombeo de agua limpia.

También es recomendable evitar la formación de depósitos en los flotadores, para respetar los umbrales de arranque y parada.

6.5 Controles

Compruebe que la bomba no presente daños y que los tornillos, tuercas y pernos estén apretados correctamente. Apriete los tornillos con el par de apriete correcto (véase el apartado 6.6) y cambie el fijador de roscas si es necesario.

6.5.1 Control de los cables eléctricos

Los cables y conductores son especialmente propensos a sufrir daños. Es necesario inspeccionarlos a intervalos regulares siempre que sea posible.

Compruebe que el cable eléctrico esté intacto y que no esté aplastado ni presente cortes u otras señales de desgaste.

Un cable dañado podría permitir la entrada de líquido en la bomba y causar dispersión eléctrica, cortocircuito, descarga eléctrica o incendio.

Compruebe que el prensacable esté intacto.

Se deberá sustituir inmediatamente los componentes dañados o defectuosos.

6.5.2 Control de los cojinetes

Todos los cojinetes son de elementos rodantes de tipo autolubricado de por vida.

Gire el eje manualmente para comprobar que se mueve con fluidez y sin ruidos anómalos. En caso contrario, habrá que sustituir los cojinetes.

Los cojinetes defectuosos pueden reducir la seguridad -Ex.

6.5.3 Procedimiento de control y cambio del aceite

Es necesario cambiar el aceite e inspeccionar los cierres mecánicos si la sonda de humedad detecta la penetración de agua en la cámara de aceite.

La cámara de aceite ha sido diseñada de tal manera que, al llenarla con la bomba en posición vertical, se alcance la cantidad correcta de aceite cuando el nivel llegue al orificio de llenado (tapón del aceite).

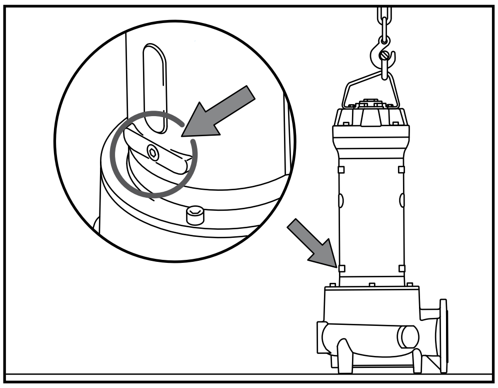
Use aceite de tipo TOTAL Bio Hydraulic TMP FR46 o equivalente con grado de viscosidad ISO (viscosidad cinemática a 40 °C) 40-90 cSt, punto de inflamabilidad ≥ 240 °C

Si no encuentra el tipo de aceite indicado, póngase en contacto con Zenit.

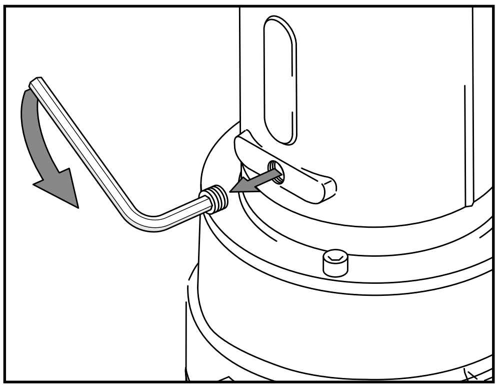
En el interior de la cámara de aceite puede formarse un exceso de presión si el cierre mecánico pierde la estanqueidad. Desenrosque el tapón lentamente, cubriéndolo con un trapo de tamaño adecuado.

El aceite usado no debe desecharse en el medio ambiente, sino que deberá llevarse a un centro de recogida especializado.

Procedimiento de cambio del aceite
Tipo de carcasa G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L

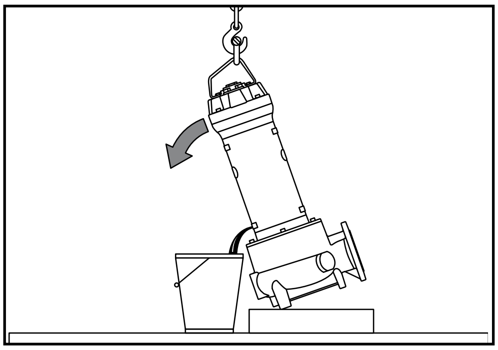


1. Coloque la electrobomba sobre una superficie uniforme y estable, utilizando un sistema de elevación idóneo que tenga la capacidad adecuada. Fíjela para impedir que ruede o que oscile.
2. Localice los tapones de la cámara de aceite de la electrobomba.

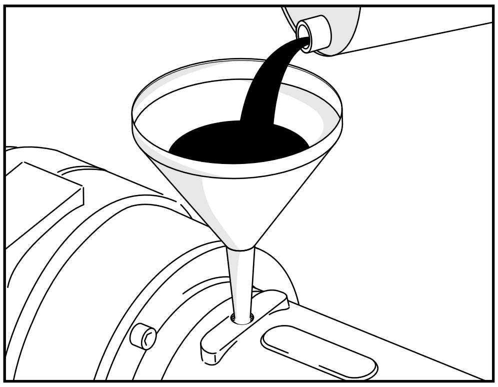


3. Desenrosque el tapón de la cámara de aceite.

ES

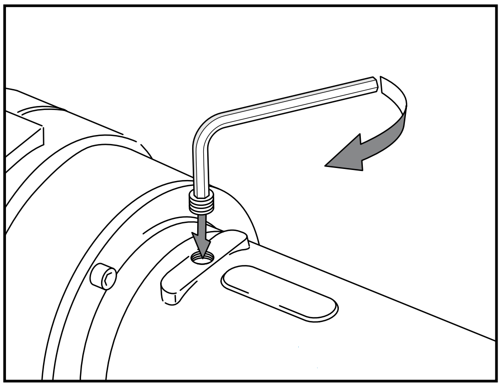


4. Descargue el aceite en un recipiente de tamaño adecuado y, si es posible, transparente.
5. Coloque el recipiente lleno de aceite en una superficie horizontal y déjelo reposar unos minutos para permitir que se deposite en el fondo toda el agua que pueda contener:
   - Aceite limpio y sin agua: el cierre mecánico está en buenas condiciones y se puede rellenar la cámara de aceite.
   - Aceite con presencia mínima de agua: puede deberse al asentamiento del cierre mecánico durante las primeras horas de funcionamiento, por lo que se trata de un fenómeno marginal sin importancia.
   - Aceite con agua e impurezas: compruebe el cierre mecánico y sustitúyalo por uno nuevo. Debe cambiarse en un centro de asistencia autorizado.



6. Coloque la bomba en horizontal sobre el banco.
7. Rellene la cámara de los cierres mecánicos con aceite lubricante biodegradable.

Tipo de carcasa	Cantidad de aceite de la cámara de cierres mecánicos (ml)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

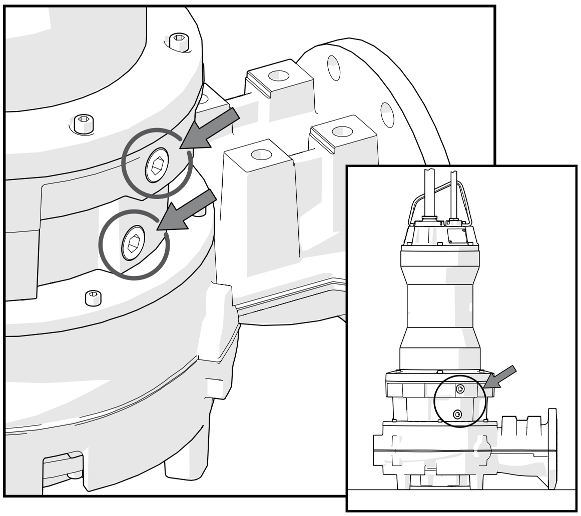


8. Enrosque el tapón de la cámara de aceite.

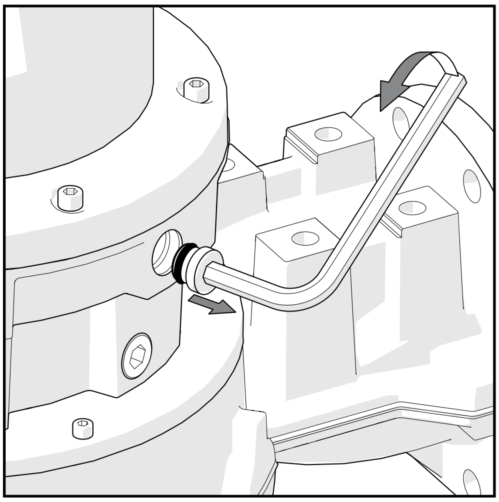
¡ATENCIÓN! **Use fijador de roscas tipo Loctite 243.**

Tipo de carcasa	Tapón de aceite
G05M - G05L **G06S - G06L** **G07S - G07L** **G08L**	1/8” NPT
G10S - G10L	3/8” DIN 906

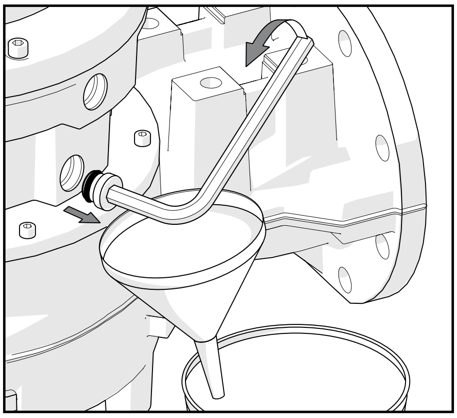
Procedimiento de cambio del aceite
Tipo de carcasa M08S - M08L



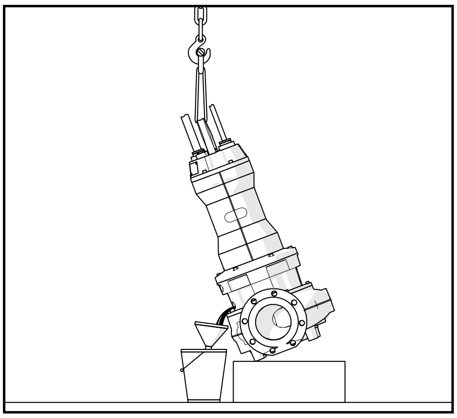
1. Coloque la electrobomba sobre una superficie uniforme y estable, utilizando un sistema de elevación idóneo que tenga la capacidad adecuada. Fíjela para impedir que ruede o que oscile.
2. Localice los tapones de la cámara de aceite de la electrobomba.



3. Desenrosque el tapón superior de la cámara de aceite.

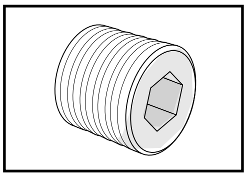


4. Desenrosque el tapón inferior de la cámara de aceite.



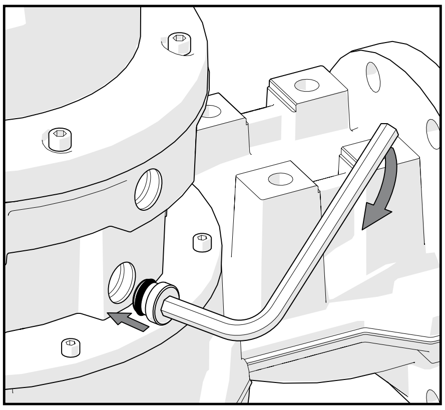
5. Descargue el aceite en un recipiente de tamaño adecuado y, si es posible, transparente.
NOTA. Para comprobar si el recipiente utilizado tiene capacidad suficiente, consulte la cantidad de aceite que contiene la cámara en la tabla.

6. Coloque el recipiente lleno de aceite en una superficie horizontal y déjelo reposar unos minutos para permitir que se deposite en el fondo toda el agua que pueda contener:
   - Aceite limpio y sin agua: el cierre mecánico está en buenas condiciones y se puede rellenar la cámara de aceite.
   - Aceite con presencia mínima de agua: puede deberse al asentamiento del cierre mecánico durante las primeras horas de funcionamiento, por lo que se trata de un fenómeno marginal sin importancia.
   - Aceite con agua e impurezas: compruebe el cierre mecánico y sustitúyalo por uno nuevo. Debe cambiarse en un centro de asistencia autorizado.

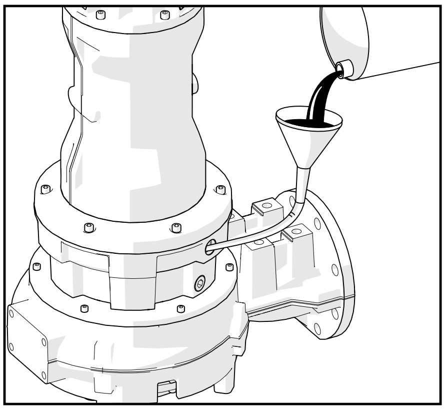


Tipo de carcasa	Tapón de la cámara de aceite
M08S - M08L	2 uds. 3/8” DIN 906

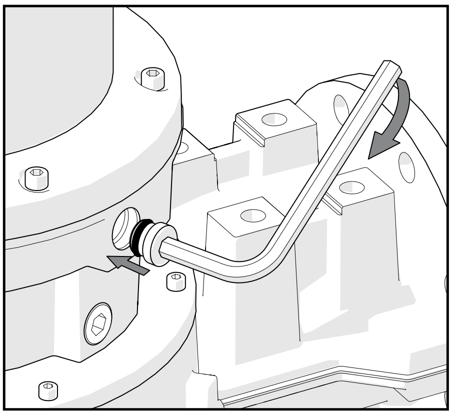
¡ATENCIÓN! Use fijador de roscas tipo Loctite 243.



7. Enrosque el tapón inferior de la cámara de aceite.



8. Rellene la cámara de los cierres mecánicos con aceite lubricante biodegradable



9. Enrosque el tapón superior de la cámara de aceite.

Tipo de carcasa	Cantidad de aceite de la cámara de cierres mecánicos (ml)
M08S - M08L	2300

6.6 Tornillería

En caso de sustitución, utilice tornillería de clase A2 70, A2 80, A4 70 o A4 80 de conformidad con la norma ISO 3506-1.

Pares de apriete (Nm)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. ELIMINACIÓN

Elimine el producto correctamente, separando los distintos componentes y enviándolos a centros de recogida selectiva.
Utilice un servicio público o privado de eliminación de residuos de conformidad con la normativa vigente en el país de uso.

Cuando aparece el símbolo del contenedor de basura tachado con un aspa en el aparato o en su envase, significa que al final del ciclo de vida útil del producto éste se deberá recoger de modo separado y no se deberá eliminar con los demás residuos urbanos no seleccionados.

Al realizar una adecuada recogida selectiva del aparato, de forma que las posteriores operaciones de reciclado, tratamiento y eliminación sean ecológicamente compatibles, se contribuye a evitar posibles impactos negativos para el medioambiente y la salud humana y se favorece la reutilización y/o el reciclado de los materiales contenidos en el aparato.
La eliminación no autorizada del producto por parte del usuario conlleva la aplicación de las sanciones administrativas previstas por la normativa vigente.

8. GUÍA DE SOLUCIÓN DE PROBLEMAS

	Problema	**Causa posible**	**Solución**
1	La bomba no arranca o bien arranca pero se para inmediatamente	Alimentación inadecuada o insuficiente (p. ej., corte de corriente, caída de tensión, etc.)	Póngase en contacto con un técnico experto
		Cable desconectado o dañado	Compruebe que el cable esté íntegro y que esté correctamente conectado a la red
		Avería en el cuadro eléctrico	Póngase en contacto con un técnico experto para averiguar la causa de la avería
		Fusibles quemados	Compruebe el tipo de fusibles y sustitúyalos por otros de valor adecuado
		Activación de la protección magnetotérmica	Véase el punto 2
		Activación de la protección térmica	Véase el punto 3
		Alarma de la sonda de humedad	Véase el punto 4
		Activación del interruptor diferencial (RCD)	Véase el punto 5
		Condensador dañado o conectado de forma incorrecta (motor ~1)	Póngase en contacto con un técnico experto para que cambie el condensador y compruebe que esté conectado correctamente
		Activación del sensor de nivel	Compruebe la conexión y el funcionamiento correctos del sensor de nivel
2	Activación del interruptor magnetotérmico	Tensión de alimentación demasiado baja o fases no equilibradas	Póngase en contacto con un técnico experto
		Conexión eléctrica incorrecta	Póngase en contacto con un técnico experto para que compruebe y corrija la conexión eléctrica
		Relé de sobrecorriente calibrado con un valor demasiado bajo o dañado	Compruebe el relé de sobrecorriente. Calibre el relé de acuerdo con el valor de corriente indicado en la placa de datos
		Arrollamiento en cortocircuito	Póngase en contacto con un centro de asistencia autorizado
		Hidráulica bloqueada por cuerpos extraños	Limpie la hidráulica y elimine la obstrucción
		Rotor bloqueado	Póngase en contacto con un centro de asistencia autorizado
3	La protección térmica se activa tras un breve tiempo de funcionamiento	La bomba está sumergida en un líquido demasiado caliente	Reduzca la temperatura del líquido
		Hidráulica bloqueada por cuerpos extraños	Limpie la hidráulica y elimine la obstrucción
		Piezas internas dañadas	Póngase en contacto con un centro de asistencia autorizado
		Tensión incorrecta	Compruebe que la tensión de alimentación coincida con la que se indica en la placa
		Cojinetes defectuosos o desgastados	Póngase en contacto con un centro de asistencia autorizado
		Número excesivo de arranques por hora	Véase el punto 6

4	Activación del interruptor diferencial (RCD)	Humedad en el motor	Póngase en contacto con un centro de asistencia autorizado
		Aislamiento reducido del motor	Póngase en contacto con un centro de asistencia autorizado
		Cable dañado	Compruebe si el cable de alimentación está en buen estado; póngase en contacto con un centro de asistencia si es necesario cambiarlo
5	La bomba funciona, pero el caudal es reducido o inexistente	Hidráulica bloqueada por cuerpos extraños	Limpie la hidráulica y elimine la obstrucción
		Tubo de salida obstruido por cuerpos extraños	Limpie el tubo de salida
		Válvula de retención bloqueada	Limpie las válvulas de retención
		Válvula de compuerta parcialmente cerrada o bloqueada	Abra la válvula de compuerta y límpiela si es necesario
		La turbina gira en sentido contrario	Compruebe el sentido de giro e invierta las conexiones eléctricas de dos de las tres fases
		Fugas en la instalación	Compruebe la instalación y elimine la causa de las fugas
		Selección incorrecta de la bomba	Sustituya la bomba por otra adecuada
6	Número excesivo de arranques por hora	Configuración incorrecta de los sensores de nivel	Corrija la configuración de los sensores de nivel
		Funcionamiento defectuoso de los sensores de nivel	Compruebe que los sensores funcionen correctamente
		Turbulencias cerca de los sensores de nivel	Elimine la causa de las turbulencias o bien cambie los sensores de nivel a otra posición
		Sumidero demasiado pequeño	Modifique las dimensiones del sumidero
7	Presencia de vibraciones o ruido excesivo	Piezas internas dañadas	Póngase en contacto con un centro de asistencia autorizado
		Cojinetes defectuosos o desgastados	Póngase en contacto con un centro de asistencia autorizado
		Turbina obstruida, desequilibrada o dañada	Póngase en contacto con un centro de asistencia autorizado
		Turbina bloqueada	Limpie la turbina y elimine la obstrucción
		La turbina gira en sentido contrario	Compruebe el sentido de giro e invierta las conexiones eléctricas de dos de las tres fases
		Ausencia de fase	Póngase en contacto con un técnico experto
		Oscilaciones de la instalación	Compruebe la instalación
8	La bomba funciona pero la absorción es excesiva	Punto de trabajo incorrecto	Compruebe que la bomba trabaje dentro de su campo de funcionamiento
		Tensión de alimentación incorrecta	Vuelva a poner la tensión de alimentación en el valor que se indica en la placa de datos
		Hidráulica bloqueada por cuerpos extraños	Limpie la hidráulica y elimine la obstrucción
		Cojinetes defectuosos o desgastados	Póngase en contacto con un centro de asistencia autorizado
		La turbina gira en sentido contrario	Compruebe el sentido de giro e invierta las conexiones eléctricas de dos de las tres fases
		Arrollamiento del estator averiado	Póngase en contacto con un centro de asistencia autorizado
9	Detección de infiltraciones	Infiltración de agua en el motor a causa de cables, juntas tóricas o prensacables dañados	Póngase en contacto con un centro de asistencia autorizado
		Infiltración de agua en la cámara de aceite a causa de desgaste o rotura de los cierres mecánicos o las juntas tóricas	

En caso de solicitar reparaciones u otras consultas, es necesario proporcionar la siguiente información acerca del producto:

Modelo	**Número de serie**	**Fecha de compra**

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Для правильной установки и безопасной эксплуатации поставляемого изделия внимательно прочитайте это руководство и бережно храните его в легкодоступном и чистом месте для будущей справки в случае необходимости.
Эксплуатация изделия не по назначению может нанести серьезный ущерб людям и имуществу, вызвать неисправности в работе и отменить действие гарантии.

1. ОБЩИЕ СВЕДЕНИЯ

1.1 Идентификация производителя

ZENIT Italia s.r.l. - via dell'Industria, 11 - 41018 S.Cesario sul Panaro (Modena) - Italia

1.2 Значение символов, используемых в этом руководстве

⚠ Внимание! Опасность для здоровья работников и сохранности электронасоса

⚡ Внимание! Присутствует опасность электрического характера

♨ Внимание! Присутствие горячих поверхностей, опасность ожогов

Ex Внимание! Инструкции для моделей с сертификатом -Ex.
Несоблюдение этих инструкций может вызвать опасность взрыва.
Рекомендуется выполнять эти инструкции также и для стандартных моделей.

ВНИМАНИЕ! Важная информация, которой необходимо уделить особенное внимание

⚠ 1.3 Общие предупреждения по безопасности

- Данное оборудование не пригодно для эксплуатации некомпетентными и/или неопытными людьми. Держите в недоступном для детей месте;
- Работы по установке должны выполняться компетентным техническим персоналом, способным понимать изложенный в руководстве материал. Персонал, выполняющий установку и обслуживание этого изделия, должен быть обучен вопросам остаточной опасности, связанной с электрическим оборудованием;
- Убедитесь, что люди не могут случайно упасть в резервуар. При необходимости установите крышку или защитные поручни;
- Во время перемещения, установки или демонтажа оборудование должно быть отключено от электропитания;
- Обратите внимание на риски, создаваемые газами и испарениями в рабочей зоне;
- Не вдыхайте и не проглатывайте никаких компонентов оборудования;
- Люди и животные не должны погружаться или же контактировать с жидкостью до тех пор, пока электронасос не был извлечен из ванны;
- Не допускайте контакт свободного конца электрического кабеля с любой жидкостью;
- Электрическая система должна иметь надежное подключение к заземлению;
- Перед подключением питания убедитесь, что оборудование правильно установлено, и отойдите на безопасное расстояние;
- Не используйте оборудование в целях, отличающихся от тех, для которых оно было спроектировано и изготовлено, так как производитель не отвечает за нанесенный оборудованием ущерб людям или имуществу, если оно использовалось способом, отличающимся от описанного в руководстве, или же при несоблюдении предписаний обслуживания и безопасности. Перед установкой в химически агрессивной среде обратитесь к производителю для проверки совместимости материалов;
- Ни в коем случае не изменяйте электронасос или его части (фитинги, отверстия, отделку и т.д.);
- Пользователь должен придерживаться действующих в стране назначения норм безопасности, правил, диктуемых здравым смыслом, а также проверять правильное выполнение операций периодической чистки и обслуживания;
- Установщик обязан проверить правильность рабочих условий окружающей среды, чтобы гарантировать безопасность и гигиену.
- Ответственность за персонал, допущенный к эксплуатации изделия, несет клиент;

1.4 Подготовка монтажников и обслуживающих специалистов

Необходимо ознакомить монтажников этого изделия и специалистов, обслуживающих его, с неустранимыми рисками, связанными с электрооборудованием, работающим в контакте с биологическими жидкостями.

Кроме того, они должны быть в состоянии прочитать и понять содержание технической документации, прилагаемой к изделию, в частности, электрические схемы подключения.

1.5 Используемые средства индивидуальной защиты (СИЗ)

Работайте с электронасосом, используя соответствующие стандартам средства индивидуальной защиты;
Следует обязательно надевать защитные перчатки, спецобувь, закрытые по бокам защитные очки и кожаный фартук.
Перед началом работы с уже установленным изделием промойте его большим количеством воды и/или моющих средств.

1.6 Остаточный риск

Изделие было разработано и изготовлено для обеспечения безопасной и надежной эксплуатации.
Тем не менее, поскольку изделие предназначено для работы с жидкостями, опасными для здоровья, монтажники этого изделия и специалисты, обслуживающие его, должны действовать крайне внимательно и всегда пользоваться средствами индивидуальной защиты, соответствующими действующим стандартам.
При выполнении любых операций на изделии мы рекомендуем предотвратить любое непроизвольное падение электронасоса и не пренебрегать опасностью ожогов, удара электрическим током, возможностью утонуть, задохнуться или отравиться при вдыхании токсичных газов.

⚡ ⚠ Ex **Для снижения риска поражения молнией пользователь должен принимать необходимые и адекватные меры по отводу молний.**
Муфты -Ex не подлежат ремонту.
Не вскрывайте оборудование при наличии взрывоопасной атмосферы

Во время выполнения операций размещения, установки или демонтажа электронасос должен быть отсоединен от щита питания.

1.7 Описание продукции / Сфера назначения

Эти изделия предназначаются для использования в очистных системах и перекачивающих станциях в гражданских, промышленных и муниципальных объектах.

Они пригодны для подъема и перекачки шлама, фекальных стоков, чистой воды, стоков, включая содержащие твердые или волокнистые примеси.

Они не могут использоваться для работы с пищевыми жидкостями и в потенциально взрывоопасной атмосфере (кроме сертифицированных взрывозащищенных моделей).

Погружные электронасосы серии Grey никогда не должны использоваться для перекачки взрывоопасных, воспламеняющихся или горючих жидкостей.

Модели -Ex сертифицированы на эксплуатацию в потенциально взрывоопасной атмосфере, в соответствии с маркировочным обозначением на паспортной табличке (см. параграф 1.12)

Этот электронасос должен быть закреплен на опоре или же установлен в специальном месте. Он не предназначается для того, чтобы его держали в руке во время использования.

Двигатели насосов Grey всегда поставляются компанией ZENIT с гибким кабелем питания, управления и цепями мониторинга. Кабельный прижим гарантирует герметичность и защиту от отрыва кабеля для безопасности установки. Это оборудование не нуждается в дополнительных принадлежностях. Подключение к системе и к электрическому щиту выполняется клиентом и должно соответствовать характеристикам оборудования.

Погружные электронасосы серии Grey классифицируются по типу гидравлической части.

- Модели DGG: погружные электронасосы с глубоко посаженной крыльчаткой vortex и большим свободным проходом
  Применение: загрязненные биологические жидкости и канализационные стоки в гражданских и промышленных перекачивающих системах, системах обработки сточных вод и на зоотехнических фермах;
- Модели DRG: погружные электронасосы с канальной крыльчаткой
  Применение: промышленные стоки и технологическая вода, перекачка гражданских стоков, дренаж и перекачка сточных вод из ванн для воды после первого дождя;
- Модели GRG: погружные электронасосы с многоканальной крыльчаткой и системой измельчения
  Применение: перекачка жидкостей, содержащих волокна или нитевидные тела в профессиональных или промышленных условиях, а также на зоотехнических фермах
- Модели APG: погружные электронасосы с многоканальной крыльчаткой и высоким напором
  Применение: перекачка чистой и содержащей песок воды, ливневых стоков и протечек

1.7.1 Определение модели

Насос может быть идентифицирован по полям TYPE и VERS на паспортной табличке. Смотрите параграф 1.12

Тип

DGG 300/2/G65V C0ET5
(A) (B) (C)
① ② ③ ④ ⑤⑥⑦⑧⑨

① Тип крыльчатки
DG = Vortex
DR = Канальная
GR = Измельчительная
AP = Высокого напора
② Серия
G = Grey

③ Мощность (л.с. x 100) / полюсы двигателя
④ Напорное отверстие
(A) ТИП (трубная резьба/фланец)
(B) ДИАМЕТР (мм)
(C) ПОЛОЖЕНИЕ
V = вертикальное
H = горизонтальное

⑤ Вариант гидравлической части
⑥ Версия гидравлической части
⑦ Размер двигателя
⑧ Кол. фаз двигателя
M = Одна фаза T = Три фазы
⑨ Частота
5 = 50 Гц 6 = 60 Гц

Версия

TS 10 400 D EX NN GG
⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Электрический вариант
⑪ Длина кабеля (м)
⑫ Номинальное напряжение

⑬ Запуск
D = DOL (прямой)
Y = звезда/треугольник
⑭ Сертификат
NN = стандартный
EX = ATEX, ATEX + IECEx
CX = IECEX

⑮ Индивидуальное исполнение
⑯ Материал крыльчатки

1.8 Технические данные

Характеристики и технические данные изделия приводятся в его технических характеристиках.
В таблице ниже указываются типы корпуса в зависимости от размеров двигателя

ОДНОФАЗНАЯ версия

Тип	Описание _ ②③_⑦⑧_	P2 (кВт)/ полюсы
G05M	_G 75/2_AM_	0.55/2
	_G 100/2_AM_	0.75/2
G05L	_G 150/2_AM_	1.1/2
	_G 200/2_AM_	1.5/2
G06L	_G 250/2_EM_	1.8/2
	_G 300/2_EM_	2.2/2
	_G 400/2_EM_	3/2
G07S	_G 550/2_FM_	4/2
G07L	_G 750/2_FM_	5.5/2
G08L	_G 1000/2_GM_	7.5/2

ТРЕХФАЗНАЯ версия

Тип	Описание _ ②③_⑦⑧_	P2 (кВт)/ Полюсы
G05M	_G 75/2_AT_	0.55/2
	_G 100/2_AT_	0.75/2
G05L	_G 150/2_AT_	1.1/2
	_G 200/2_AT_	1.5/2
	_G 250/2_AT_	1.8/2
	_G 100/4_AT_	0.75/4
	_G 150/4_AT_	1.1/4
	_G 200/4_AT_	1.5/4
G06S	_G 300/2_ET_	2.2/2
	_G 200/4_ET_	1.5/4
G06L	_G 400/2_ET_	3/2
	_G 250/4_ET_	1.8/4
	_G 300/4_ET_	2.2/4
	_G 400/4_ET_	3/4
G07S	_G 550/2_FT_	4/2
	_G 750/2_FT_	5.5/2
G07L	_G 1000/2_FT_	7.5/2
	_G 550/4_FT_	4/4
	_G 750/4_FT_	5.5/4

ТРЕХФАЗНАЯ версия

Тип	Описание _ ②③_⑦⑧_	P2 (кВт)/ Полюсы
G08L	_G 1200/2_GT_	9/2
	_G 1500/2_GT_	11/2
	_G 1750/2_GT_	13/2
	_G 1000/4_GT_	7.5/4
G10S	_G 2000/2_HT_	15/2
	_G 1200/4_HT_	9/4
	_G 1500/4_HT_	11/4
	_G 1000/6_HT_	7.5/6
G10L	_G 2500/2_HT_	18.5/2
	_G 2000/4_HT_	15/4
	_G 1200/6_HT_	9/6
	_G 1500/6_HT_	11/6
	_G 1750/6_HT_	13/6
M08S	_G 400/6_GT_	3/6
M08L	_G 550/6_GT_	4/6
	_G 750/6_GT_	5.5/6

1.9 Рабочие условия

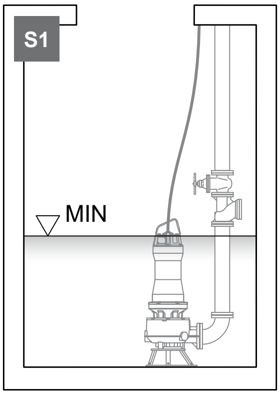
Для правильной эксплуатации насоса соблюдайте следующие рабочие условия:

- Температура жидкости/окружающей среды: 0 ÷ 40 °C
- pH: 6 ÷ 14
- Назначение: Однофазные модели: S1 - полностью погруженный насос **(Рис. 1)**
  Трехфазные модели: S1 - полностью погруженный насос **(Рис. 1)**
  S3 - корпус насоса полностью погружен или же заполнен **(Рис. 2A, 2B, 2C)**, согласно параметру S3% в паспортной табличке, указанному в **ТАБЛИЦА 1.**
- Количество запусков в час: макс. 20 для двигателей с мощностью P2 до 10 кВт, макс. 15 для P2 свыше 10 кВт

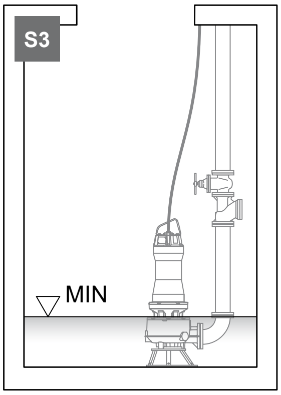
1.10 Специальные условия

Электронасос может работать непрерывно (S1), только если он полностью погружен.
При сухой установке оборудование должно работать с циклическими перерывами **(S3).**
Должны использоваться не менее двух датчиков уровня (с резервом) для отключения питания в случаях, когда жидкость опустится ниже минимального уровня:
S1: полностью погруженный насос **(Рис. 1)**
S3 - корпус насоса полностью погружен или же заполнен **(Рис. 2A, 2B, 2C)**

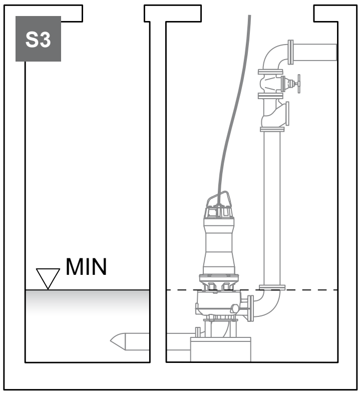
ВНИМАНИЕ! Всегда проверяйте, чтобы насос работал с правильным минимальным уровнем жидкости (см. параграф 3.3) рекомендуется всегда проверять исправную работу электронасоса в условиях минимального уровня жидкости; в зависимости от специфичности установки может возникнуть необходимость в принятии дополнительных мер по предотвращению образования водоворотов с последующим попаданием воздуха в водозабор электронасоса.



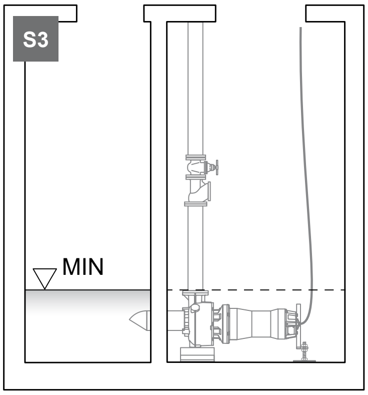
1



2A



2B



2C

Для отключения питания в случае перегрева двигателя оборудование серийно комплектуется тепловой защитой в обмотках статора (см. параграф 4.4)

Пользователь должен обязательно подключить тепловую защиту к оборудованному расцепителем щиту управления, подготовленному для предотвращения автоматического перезапуска оборудования.

Работа при помощи инвертора: тепловая защита должна быть правильно подключена к электрическому щиту, чтобы отключать питание в случае перегрева двигателя.

Насосы Grey оборудуются датчиком влажности для обнаружения наличия воды в масляной камере (отсек с сальниками).

Датчик влажности должен быть правильно подключен в соответствии с инструкциями, приведенными в параграфе 4.5.

Крепеж и крепления должны быть класса A2-70, A2-A80, A4-70 или A4-80, в соответствии со стандартом EN ISO 3506-1

Насос в версии -Ex может работать в режиме S3, в соответствии со значением S3%, приведенным на паспортной табличке, как указывается в следующей таблице:

ТАБЛИЦА 1: Режим эксплуатации S3 для моделей в версии -Ex

Тип корпуса	Описание _ ②③_⑦⑧_	P2 (кВт)/ Полюсы	Режим
G05M	_G 75/2_AT_	0.55/2	50%
	_G 100/2_AT_	0.75/2	50%
G05L	_G 150/2_AT_	1.1/2	30%
	_G 200/2_AT_	1.5/2	30%
	_G 250/2_AT_	1.8/2	20%
	_G 100/4_AT_	0.75/4	15%
	_G 150/4_AT_	1.1/4	15%
	_G 200/4_AT_	1.5/4	15%
G06S	_G 300/2_ET_	2.2/2	20%
	_G 200/4_ET_	1.5/4	20%
G06L	_G 400/2_ET_	3/2	20%
	_G 250/4_ET_	1.8/4	20%
	_G 300/4_ET_	2.2/4	20%
	_G 400/4_ET_	3/4	15%
G07S	_G 550/2_FT_	4/2	20%
	_G 750/2_FT_	5.5/2	15%
G07L	_G 1000/2_FT_	7.5/2	10%
	_G 550/4_FT_	4/4	15%
	_G 750/4_FT_	5.5/4	15%
G08L	_G 1200/2_GT_	9/2	15%
	_G 1500/2_GT_	11/2	15%
	_G 1750/2_GT_	13/2	10%
	_G 1000/4_GT_	7.5/4	15%
G10S	_G 2000/2_HT_	15/2	10%
	_G 1200/4_HT_	9/4	15%
	_G 1500/4_HT_	11/4	10%
	_G 1000/6_HT_	7.5/6	10%
G10L	_G 2500/2_HT_	18.5/2	15%
	_G 2000/4_HT_	15/4	15%
	_G 1200/6_HT_	9/6	15%
	_G 1500/6_HT_	11/6	15%
	_G 1750/6_HT_	13/6	15%
M08S	_G 400/6_GT_	3/6	20%
M08L	_G 550/6_GT_	4/6	20%
	_G 750/6_GT_	5.5/6	20%

1.11 Гарантийные условия

Компания ZENIT гарантирует работу оборудования в соответствии с проектными параметрами, при условии соблюдения рабочих требований, приведенных в документации на изделие. Гарантия на отдельные компоненты составляет 12 месяцев с даты отгрузки. Компания Zenit обязуется отремонтировать или заменить изделие, неисправность которого вызвана дефектами проектирования, обработки или сборки, если о таких дефектах будет сообщено компании Zenit в течение гарантийного срока.

Гарантия не распространяется на неисправности, вызванные:

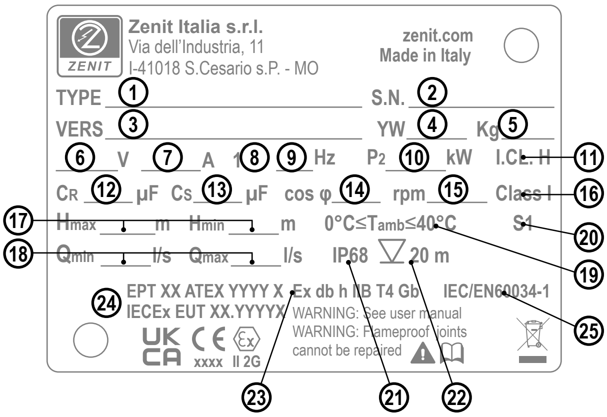
- обычным износом;
- размещением, установкой и эксплуатацией, выполненными не в соответствии с инструкциями;
- эксплуатацией с неправильно подключенными системами управления;
- работами, выполненными неквалифицированным персоналом;
- использованием нефирменных запасных частей.

ВНИМАНИЕ! **Любое изменение, внесенное в изделие без разрешения изготовителя, может создавать опасные ситуации, вызывать ухудшение характеристик, кроме того, оно отменяет действие гарантии.**

1.12 Паспортная табличка (Рис. 3A, 3B)

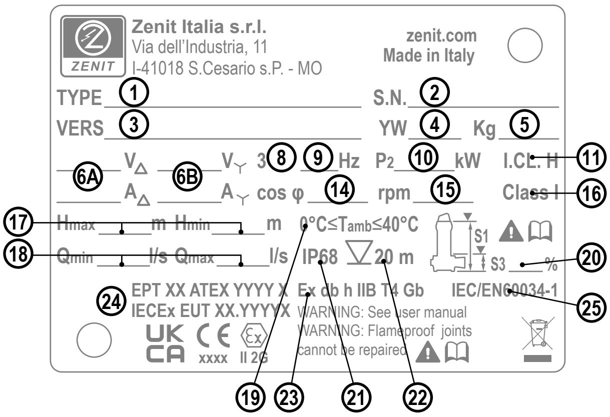
На крышку двигателя установлена металлическая паспортная табличка с указанием данных и сертификатов на этот насос.
Вместе с данным руководством была предоставлена серебристая самоклеящаяся этикетка, на которой приводятся характеристики изделия, указанные на закрепленной на насосе металлической табличке. Рекомендуется наклеить эту этикетку в специальном месте в руководстве и использовать указанные в ней данные для будущих запросов или для получения информации.

Однофазный


ZENIT
Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
⑥ V ⑦ A 1 ⑧ ⑨ Hz P2 ⑩ kW I.CL. H ⑪
CR ⑫ µF CS ⑬ µF cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1 ⑳
⑱ Qmin l/s Qmax l/s IP68 20 m ⑲
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1 ㉕
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
㉓ ㉑ ㉒

3A

Трехфазный


ZENIT
Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy
TYPE ①
S.N. ②
VERS ③
YW ④
Kg ⑤
V△ V⅄ 3 ⑧ ⑨ Hz P2 ⑩ kW I.CL. H ⑪
⑥A A△ ⑥B A⅄ cos φ ⑭ rpm ⑮ Class I ⑯
⑰ Hmax m Hmin m 0°C≤Tamb≤40°C S1
⑱ Qmin l/s Qmax l/s IP68 20 m S3 % ⑳
㉔ EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1 ㉕
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G
⑲ ㉓ ㉑ ㉒

3B

1. Наименование изделия
2. Заводской номер
3. Версия
4. Год и неделя выпуска
5. Вес
6. Номинальное напряжение
6A. Напряжение и ток *(подключение треугольником)*
6B. Напряжение и ток *(подключение звездой)*
7. Номинальный ток
8. Фазы
9. Частота
10. Мощность двигателя P2
11. Класс изоляции двигателя
12. Конденсатор хода
13. Конденсатор пикового момента
14. Коэффициент мощности
15. Скорость *(об/мин)*
16. Класс защиты МЭК от электрических разрядов
17. Минимальный и максимальный напор
18. Минимальная и максимальная производительность
19. Температура окружающей среды
20. Режим эксплуатации
21. Код IP *(степень защиты корпуса)*
22. Максимальная глубина погружения
23. Маркировочное обозначение ATEX и/или IECEx *(только модели -Ex)*
24. Номер сертификата ATEX и IECEx *(только модели -Ex)*
25. Нормы для справок по двигателю

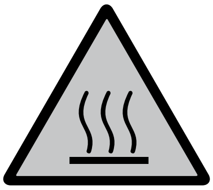
1.13 Значение маркировки -Ex

CE XXXX	Маркировка CE соответствия директиве ATEX 2014/34/ЕС XXXX обозначает номер нотифицированного органа (указанного на табличке), который сертифицировал систему менеджмента качества для ATEX

Маркировочное обозначение -Ex	
Ex II 2G *(только ATEX)*	Ex db h IIB T4 Gb

Символ	Значение
Ex	Специальная маркировка взрывозащищенности согласно Прилож. II Директивы ATEX 2014/34/ЕС
II	Группа оборудования. Группа II: электрическое оборудование для эксплуатации в потенциально взрывоопасной атмосфере ввиду наличия газов, не являющееся горнопроходческими.
2G	Категория оборудования, являющегося предметом сертификации для потенциально взрывоопасной атмосферы ввиду наличия газа, паров, тумана (G). Оборудование может быть установлено в ЗОНЕ 1
Ex db h IIB	Способ использованной для оборудования электрической защиты соответствует защите при помощи взрывозащищенного корпуса “db”, пригодного для газов группы IIB и IIA. Использованный для оборудования способ механической защиты предусматривает погружение в жидкость "к" и конструктивную безопасность "c" - пригодно для газов группы IIB и IIA.
T4	Класс температуры оборудования (максимальная температура поверхности 135 °C)
Gb	Оборудование с "высоким" уровнем защиты (EPL Gb), пригодное для эксплуатации в ЗОНЕ 1

1.14 Самоклеящиеся этикетки, приклеенные к изделию



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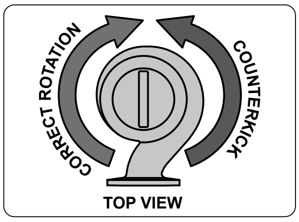

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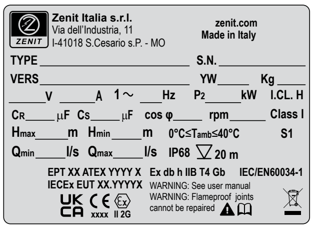

Zenit Italia s.r.l.
Via dell'Industria, 11
I-41018 S.Cesario s.P. - MO
zenit.com
Made in Italy

TYPE____________________ S.N.____________
VERS____________________ YW_____ Kg_____
_____V _____A 1~ ____Hz P_2_____kW I.CL. H
C_R_____μF C_S_____μF cos φ_____ rpm_____ Class I
H_{max}_____m H_{min}_____m 0°C≤T_{amb}≤40°C S1
Q_{min}_____l/s Q_{max}_____l/s IP68 ▽ 20 m
EPT XX ATEX YYYY X Ex db h IIB T4 Gb IEC/EN60034-1
IECEx EUT XX.YYYYX
WARNING: See user manual
WARNING: Flameproof joints cannot be repaired
UK CA CE xxxx II 2G

6

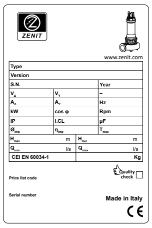

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Рис. 4 - Идентификационная этикетка, обозначающая перегревающиеся поверхности
Рис. 5 - Идентификационная этикетка для определения правильного направления вращения крыльчатки (вид сверху)
Рис. 6 - Серебристая этикетка. Воспроизводит паспортную табличку, установленную на изделие, подлежит наклеиванию в предусмотренном месте данного руководства. На нее следует ссылаться для получения любой информации или запроса.
Рис. 7 - Этикетка, наклеенная на упаковку изделия

2. ПЕРЕВОЗКА И ХРАНЕНИЕ

2.1 Визуальный контроль

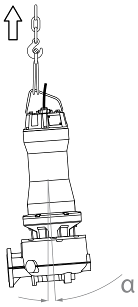
Осмотрите упаковку и убедитесь, что она не повреждена. Удалите упаковочные материалы и утилизируйте их в соответствии с действующими правилами. При использовании острых инструментов обратите внимание, чтобы не пораниться и не повредить изделие, особенно электрические провода.
Осмотрите изделие на предмет поврежденных или недостающих частей. При обнаружении недостачи обратитесь в компанию Zenit (или к ее дистрибьютору) или к экспедитору.
Убедитесь, что данные, приведенные на паспортной табличке, соответствуют данным заказанного изделия.

2.2 Перемещение и подъем

Подъем и размещение электронасоса должны выполняться при помощи цепи или ремня, закрепленного за верхнюю ручку, используя пригодное механическое средство (кран, лебедку и т.д.).
Перед выполнением подъема проверьте массу изделия, указанную на паспортной табличке, и используйте ремни, цепи и крюки с соответствующими характеристиками и сертификатами.
Убедитесь, что электронасос надежно зацеплен и не может упасть, перевернуться или раскачиваться.
Верхняя ручка была спроектирована для обеспечения равновесия электронасоса во время подъема, тем не менее, в момент отрыва насоса от пола он может начать раскачиваться **(Рис. 8).**
Мы рекомендуем отойти от электронасоса во время его размещения.
Всегда надевайте средства индивидуальной защиты.

ВНИМАНИЕ! **Перед подъемом насоса выполните требования местных правил по предельному весу перемещаемых вручную предметов, то есть, без использования подъемных средств.**

ВНИМАНИЕ! **НИ В КОЕМ СЛУЧАЕ НЕ используйте питающие или сигнальные провода для перемещения изделия.**



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Убедитесь, что атмосфера в зоне выполнения работ не является потенциально взрывоопасной. Классификация места установки должна определяться собственником.

2.3 Хранение

Во время хранения электронасос необходимо убрать в его упаковке в надлежащее место, недоступное для детей или посторонних лиц, он должен быть должным образом обезопасен от случайных падений и защищен от попадания влаги и пыли, от вибрации и от экстремальных температур (ниже -20 °C и выше +60 °C).

ВНИМАНИЕ! **В случае замерзания электронасоса не используйте пламя для его размораживания, а погрузите его в жидкость, в которую он будет установлен, пока он не оттает.**

Если изделие подвергалось воздействию низких температур, то проверьте состояние масла и сальников.

ВНИМАНИЕ! **Периодически (не реже раза в 2 месяца) поворачивайте крыльчатку, чтобы не допустить слипания сальников друг с другом.**

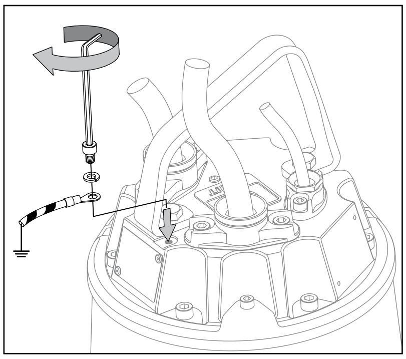
3. УСТАНОВКА

3.1 Общие предупреждения по безопасности

- Обозначьте должным образом рабочую зону и наденьте средства индивидуальной защиты.
- Перед выполнением каких бы то ни было действий убедитесь, что электронасос и электрический щит отключены от сети и на них не может быть случайно подано напряжение.
- Проверьте целостность электрического провода и уплотнений, убедитесь в том, что крыльчатка свободно вращается.
- Размеры ванны установки электронасоса должны быть таковы, чтобы:
- - поплавковые регуляторы уровня, при их наличии, могли свободно двигаться;
- - не допускать превышения количества циклов пуска/остановки электронасоса, указанного в технических характеристиках.
- Электронасос необходимо опустить в ванну при помощи ремня или цепи соответствующих размеров, закрепленной за ручку.
- Перед установкой убедитесь, что дно ванны является ровным.
- Во избежание проблем кавитации, вызванных всасыванием воздуха, убедитесь в том, что жидкости не подаются в ванну вблизи электронасоса или непосредственно в его направлении.
- Убедитесь в том, что электронасос работает в пределах графика рабочих характеристик.

Убедитесь, что атмосфера в зоне выполнения работ не является потенциально взрывоопасной.
Люди не должны иметь возможности доступа в места установки, если атмосфера является взрывоопасной.
Классификация места установки должна быть одобрена местными органами пожарной охраны для каждого конкретного случая.

Разряд электростатического заряда, скопившегося на изолированных деталях, может стать причиной взрыва.
В электронасосах -EX отсутствуют изолированные детали, способные накапливать электростатический заряд. Кроме того, все они оборудованы винтом для подключения к равнопотенциальной сети заземления (Рис. 9).
Возможные дополнительные элементы, установленные в опасной зоне, должны быть подключены к заземлению в соответствии со стандартом EN 1127-1.
Проверяйте, предназначен ли каждый из установленных в опасной зоне элементов для эксплуатации в потенциально взрывоопасной атмосфере.



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Перед установкой проверяйте уровень масла в масляной камере сальников.

3.2 Проверка направления вращения крыльчатки

Перед выполнением окончательного электрического подключения квалифицированный специалист должен проверить направление вращения крыльчатки.
На электронасосе приклеена этикетка, указывающая направление вращения крыльчатки (зеленая стрелка) и направление отдачи (красная стрелка), смотря на электронасос сверху **(Рис. 5).**

Все описанные ниже операции должны выполняться в безопасном месте, в отсутствии потенциально взрывоопасной атмосферы.

Действуйте следующим образом:
1. Установите электронасос вертикально на опорных ножках или основании.
2. Зацепите цепь или ремень подходящих размеров за верхнюю ручку электронасоса во избежание неожиданного падения, которое может произойти в результате отдачи.

ВНИМАНИЕ! **Отдача может быть очень сильной. Во время выполнения этой процедуры не стойте рядом с электронасосом.**

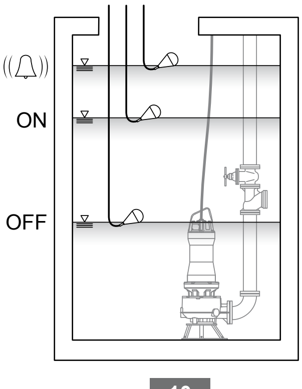
3. Временно подключите желто-зеленый проводник к заземлению системы, затем проводники электропитания к дистанционному выключателю.
4. Освободите зону вокруг электронасоса от людей и предметов в радиусе не менее 2 метров.
5. Включите выключатель запуска, подайте питание на электронасос на несколько секунд, после чего отключите питание при помощи выключателя остановки.
6. Убедитесь, что направление вращения является правильным.

Если направление вращения обратное, то поменяйте местами подключение двух из трех фаз питания электронасоса и попробуйте еще раз, выполняя заново описанную процедуру.
Определив подключение для правильного направления вращения, ОБОЗНАЧЬТЕ правильный порядок подключения проводов к щиту, после чего ОТКЛЮЧИТЕ провода питания электронасоса и выполните окончательную установку.

ВНИМАНИЕ! **Если несколько электронасосов подключены к одному и тому же электрическому щиту, необходимо выполнять проверку направления вращения отдельно для каждого установленного изделия.**

3.3 Установка системы поплавкового контроля уровня

Поплавковые выключатели позволяют управлять запуском и остановкой одного или нескольких электронасосов в зависимости от уровня жидкости, имеющегося в ванне.
Кроме того, они могут быть подключены к устройствам аварийной сигнализации для предотвращения возникновения аномальных условий (перелив или работа всухую) **(Рис. 10)**.
Поплавковые выключатели должны устанавливаться вдали от возможных водоворотов или мест падения воды.



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При наличии сильной турбулентности рекомендуется закрепить поплавки на жесткой штанге внутри колодца.
Убедитесь в отсутствии предметов, которые могут препятствовать движению поплавков. Кроме того, их кабели не должны мешать друг другу, а также закручиваться или застревать в выступах в ванне.
Поплавковые выключатели должны устанавливаться таким образом, чтобы обеспечивать правильный минимальный уровень жидкости

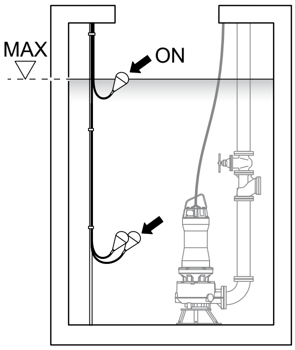
Минимальный уровень жидкости должен контролироваться двумя поплавковыми выключателями (с избыточностью), чтобы отключить питание, когда жидкость достигнет минимального уровня (насос полностью погружен). Используйте лишь только поплавковые выключатели, пригодные для классификации -Ex места установки. Подключение к электрощиту управления должно осуществляться с применением интерфейса с искрозащитой типа барьер Зенера или барьер с гальванической развязкой.

Убедитесь в том, что переключение **с остановки на пуск** происходит только и исключительно тогда, когда поплавка находятся в положении, указанном на **Рис. 11A, 11B, 11C.**

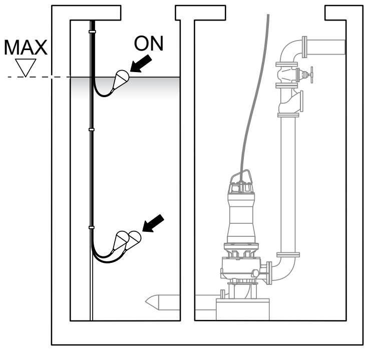
Убедитесь в том, что переключение **с пуска на остановку** происходит только и исключительно тогда, когда поплавка находятся в положении, указанном на **Рис. 12A, 12B, 12C.**

Электрические подключения поплавков должны быть выполнены таким образом, чтобы обеспечить остановку насоса в случае неисправности поплавков.

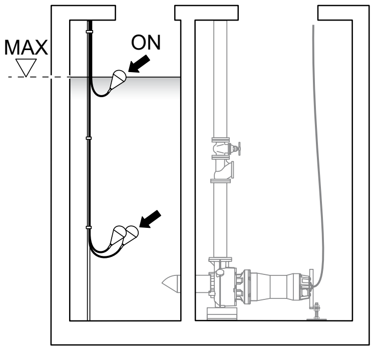
Убедитесь, что реальный объем жидкости в ванне не опускается до такого значения, при котором количество запусков в час будет превышать максимально разрешенное



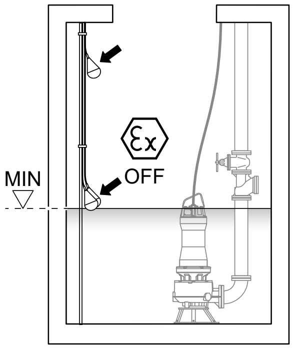
11 A



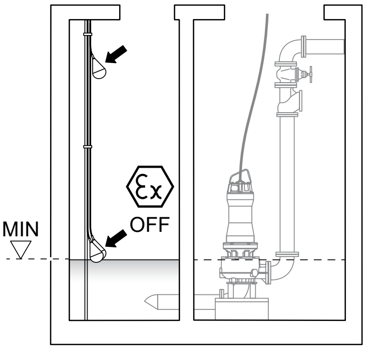
11 B



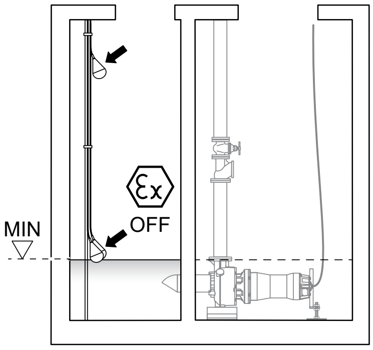
11 C



12 A



12 B



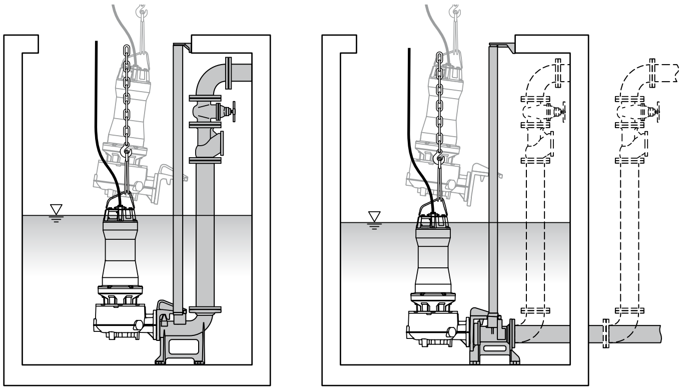
12 C

3.4 Допустимые типы установки

Убедитесь, что атмосфера в зоне выполнения работ не является потенциально взрывоопасной.

3.4.1 Установка с соединительным устройством DAC

Этот тип установки **(Рис. 13)** позволяет быстро извлечь электронасос из ванны и снова установить его на место без выполнения каких-либо действий на установке.



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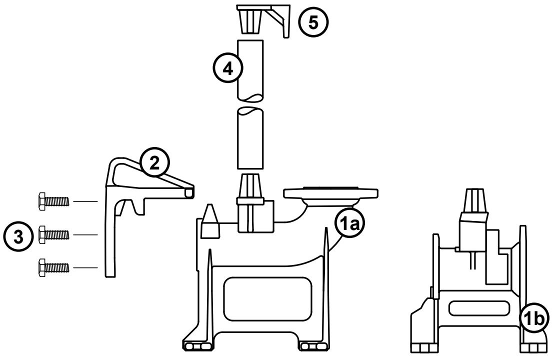
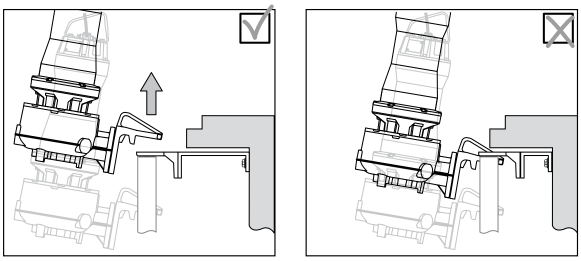


1a. Соединительное устройство DAC V
(с вертикальным напорным отверстием)
1b. Соединительное устройство DAC H
(с горизонтальным напорным отверстием)
2. Соединительный фланец
3. Винты
4. Направляющие трубы (не входят в комплект поставки)
5. Распорный кронштейн

Процедура установки (ПРИЛОЖЕНИЕ 1, стр. 130)

1. Убедитесь, что электронасос отсоединен от сети питания и что крыльчатка вращается в правильном направлении в соответствии с процедурой, описанной в руководстве.
2. Прикрепите фланец к напорному отверстию электронасоса, используя винты, входящие в комплект поставки. Для моделей с крюком прикрепите крюк к корпусу насоса при помощи винтов, входящих в комплект поставки.
3. Установите соединительное устройство на дно ванны и отметьте положение крепежных отверстий.
4. Просверлите отверстия необходимого диаметра, учитывая крепежные прорези соединительного устройства, после чего окончательно закрепите его на дне ванны при помощи дюбелей или химических анкеров. Используйте крепеж из нержавеющей стали или защитите винты и гайки антикоррозийным средством.
5. Подключите напорную трубу к соединительному устройству. Мы рекомендуем установить отсекающую задвижку и шаровой стопорный клапан со свободным интегральным просветом, используя соединительную трубу, длина которой составляет не менее 5 диаметров напорного отверстия.
6. Смонтируйте отрезанные по размеру направляющие трубы на соединительное устройство. Можно использовать трубы из оцинкованного железа или предпочтительнее - из нержавеющей стали необходимого диаметра (смотри технические характеристики).
7. Установите распорный кронштейн на верхний конец направляющих труб и отметьте положение крепежных отверстий на одной из стенок ванны. Убедитесь, что направляющие трубы расположены строго вертикально, используя отвес или жидкостный уровень

ВНИМАНИЕ! Перед закреплением распорного кронштейна убедитесь в том, что, поднимая электронасос, можно полностью снять соединительный фланец с направляющих труб (Рис. 14).



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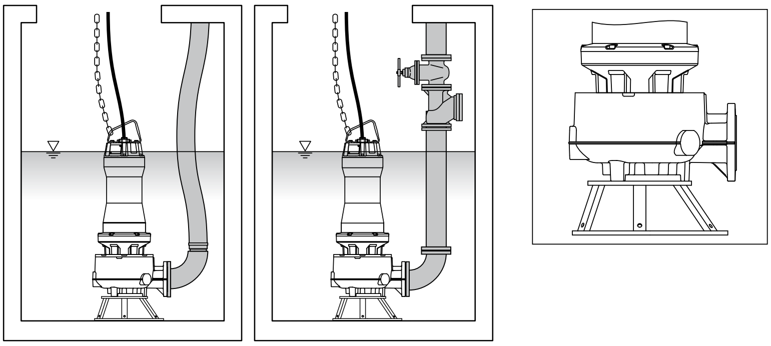
8. Просверлите отверстия необходимого диаметра, учитывая крепежные прорези распорного кронштейна, после чего окончательно закрепите его при помощи дюбелей или химических анкеров. Защитите винты и гайки средством, предотвращающим коррозию.
9. Очистите ванну от мусора и оставшихся отходов.
10. Зацепите цепь или ремень необходимых размеров за ручку и опустите электронасос в ванну, смещая фланец по направляющим трубам вплоть до стыковки с соединительным устройством.
11. Закрепите электрические провода так, чтобы они не перекручивались и не тянулись, а также не всасывались электронасосом.
12. Выпустите электрические провода из ванны, проложив их по чистому и ровному каналу. Не допускайте крутых поворотов электрического провода, его раздавливания и повреждения.
13. Подключите электрические кабели к пульту управления.

3.4.2 Нестационарная установка

В нестационарной установке **(Рис. 15)** электронасос устанавливается на специальную подставку, держащую его в вертикальном положении на дне ванны и обеспечивающую нужную высоту всасывающей горловины.



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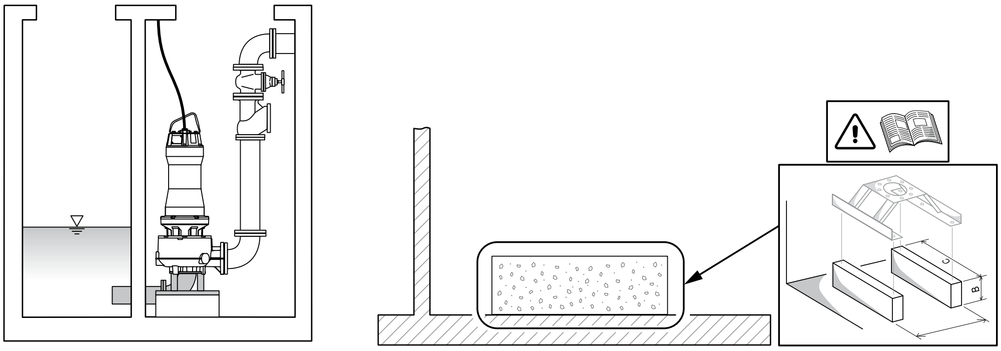
Процедура установки (ПРИЛОЖЕНИЕ 2, стр. 131)

1. Убедитесь, что электронасос отсоединен от сети питания и что крыльчатка вращается в правильном направлении в соответствии с процедурой, описанной в руководстве.
2. Опустите электронасос на подставку, используя цепь или ремень необходимых размеров, зацепленный за ручку. Убедитесь, что электронасос не может упасть и/или раскачиваться.
3. Закрепите электронасос за подставку при помощи входящих в комплект винтов.
4. Соедините напорное отверстие с трубой посредством унифицированного фланца. Используйте крепеж из нержавеющей стали или защитите винты и гайки антикоррозийным средством. Мы рекомендуем установить отсекающую задвижку и шаровой стопорный клапан со свободным интегральным просветом, используя соединительную трубу, длина которой составляет не менее 5 диаметров напорного отверстия.
5. Если применяются гибкие трубы, то необходимо использовать фланцевый штуцер. Для обеспечения постоянства свободного просвета даже в соответствии с поворотами или изменениями направления, предпочтительнее использование трубы со спиральным усилением или полужесткого типа. Прикрепите трубу к соединению при помощи металлического хомута.
6. Опустите электронасос в ванну, пока он не встанет устойчиво на дно, используя цепь или ремень необходимых размеров, зацепленный за ручку. Убедитесь, что электронасос не может упасть и/или раскачиваться.
7. Закрепите электрические провода так, чтобы они не перекручивались и не тянулись, а также не всасывались электронасосом.
8. Выпустите электрические провода из ванны, проложив их по чистому и ровному каналу. Не допускайте крутых поворотов электрического провода, его раздавливания и повреждения.
9. Подключите электрические кабели к пульту управления.

3.4.3 Вертикальная установка в сухой камере

В случае вертикальной установки в сухой камере **(Рис. 16)**, по заказу, электронасос поставляется с всасывающим фланцем, подготовленным для крепления подставки с коленом (KBC)



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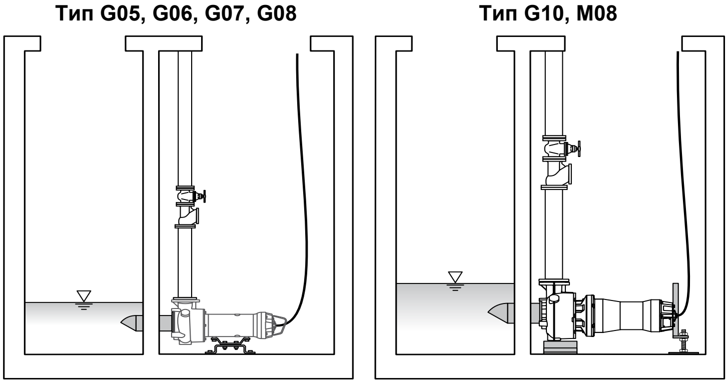
Процедура установки (ПРИЛОЖЕНИЕ 3, стр. 132)

1. Изготовьте на дне ванны два суппорта из пригодного материала, который будет выдерживать вес и нагрузки электронасоса (цемент, бетон, каменная кладка и т.д.), чтобы добиться правильной высоты всасывающей горловины. Рекомендованные размеры приводятся в технических характеристиках;
2. Убедитесь, что электронасос отсоединен от сети питания и что крыльчатка вращается в правильном направлении в соответствии с процедурой, описанной в руководстве.
3. Разместите электронасос на основании и закрепите его крепежными болтами;
4. Подключите фланцевое колено к всасывающей горловине электронасоса крепежными болтами. В случае необходимости положите электронасос и закрепите его, чтобы предотвратить случайные движения;
5. Зацепите цепь или ремень соответствующих размеров за ручку электронасоса и опустите его в ванну, установив основание на суппорты на дне ванны;
6. Отметьте положение крепежных отверстий;

7. Просверлите отверстия необходимого диаметра в соответствии с крепежными прорезями основания;
8. Надежно прикрепите основание к двум суппортам при помощи химических или расширяющихся дюбелей. Используйте крепеж из нержавеющей стали или защитите винты и гайки антикоррозийным средством;
9. Подключите всасывающую трубу к фланцевому колену;
10. Подключите напорную трубу к электронасосу. Мы рекомендуем установить отсекающую задвижку и шаровой стопорный клапан со свободным интегральным просветом, используя соединительную трубу, длина которой составляет не менее 5 диаметров напорного отверстия.
11. Очистите ванну от мусора и оставшихся отходов.
12. Закрепите электрические провода так, чтобы они не перекручивались и не тянулись.
13. Выпустите электрические провода из ванны, проложив их по чистому и ровному каналу. Не допускайте крутых поворотов электрического провода, его раздавливания и повреждения.
14. Подключите электрические кабели к пульту управления.

3.4.4 Горизонтальная установка в сухой камере

Для выполнения горизонтальной установки **(Рис. 17)**, электронасос подготовлен для крепления к металлической опорной конструкции (KBS-H).



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Процедура установки (тип G05, G06, G07, G08) (ПРИЛОЖЕНИЕ 4, стр. 133)
1. Убедитесь, что электронасос отсоединен от сети питания и что крыльчатка вращается в правильном направлении в соответствии с процедурой, описанной в руководстве.
2. Установите нижний кронштейн на дно ванны. Используйте крепеж из нержавеющей стали или защитите винты и гайки антикоррозийным средством.
3. Установите верхний кронштейн на насосе.
4. Положите насос, поместив верхний кронштейн на нижний.
5. Надежно соедините кронштейны друг с другом болтами.
6. Подключите всасывающую и напорную трубу. Мы рекомендуем установить отсекающую задвижку и шаровой стопорный клапан со свободным интегральным просветом, используя соединительную трубу, длина которой составляет не менее 5 диаметров напорного отверстия.
7. Очистите ванну от мусора и оставшихся отходов.
8. Закрепите электрические провода так, чтобы они не перекручивались и не тянулись.
9. Выпустите электрические провода из ванны, проложив их по чистому и ровному каналу. Не допускайте крутых поворотов электрического провода, его раздавливания и повреждения.
10. Подключите электрические кабели к пульту управления.

Процедура установки (тип G10, M08) (ПРИЛОЖЕНИЕ 4, стр. 133)
1. Убедитесь, что электронасос отсоединен от сети питания и что крыльчатка вращается в правильном направлении в соответствии с процедурой, описанной в руководстве.
2. Установите электронасос вертикально на ровную и прочную поверхность.
3. При наличии подъемной ручки снимите ее крепежные винты и удалите ее. В качестве альтернативы отвинтите и удалите рым-болты.
4. Установите верхний кронштейн на крышку двигателя электронасоса. Обратите внимание на то, чтобы не повредить электрические провода.
5. Установите распорную деталь на верхний кронштейн, не затягивая крепежные гайки.
6. Установите нижний кронштейн на корпус насоса.
7. При помощи отвеса отрегулируйте положение распорной детали таким образом, чтобы ее опорная плита находилась на одной плоскости с плитой нижнего кронштейна. Затяните гайки распорной детали.
8. Положите электронасос в нужное положение, используя подходящее подъемное средство (кран, лебедка). Для подъема электронасоса примените цепь или ремень с размерами, соответствующими поднимаемой массе. При отрыве электронасоса от пола он может раскачиваться, будьте внимательны.
9. Окончательно закрепите систему на дне ванны при помощи дюбелей или химических анкеров. Используйте крепеж из нержавеющей стали или защитите винты и гайки антикоррозийным средством.
10. Подключите всасывающую и напорную трубу. Мы рекомендуем установить отсекающую задвижку и шаровой стопорный клапан со свободным интегральным просветом, используя соединительную трубу, длина которой составляет не менее 5 диаметров напорного отверстия.
11. Очистите ванну от мусора и оставшихся отходов.
12. Закрепите электрические провода так, чтобы они не перекручивались и не тянулись.
13. Выпустите электрические провода из ванны, проложив их по чистому и ровному каналу. Не допускайте крутых поворотов электрического провода, его раздавливания и повреждения.
14. Подключите электрические кабели к пульту управления.

4. ЭЛЕКТРИЧЕСКОЕ ПОДКЛЮЧЕНИЕ

4.1 Общие предупреждения по безопасности

Все операции по подключению к электрической сети должны выполняться квалифицированным специалистом, при соблюдении действующих норм. Неправильно выполненное электрическое подключение может стать причиной пожаров, опасности поражения током и ущерба изделию.

- Убедитесь, что неиспользованные проводники были должным образом изолированы и закреплены в электрическом щите.
- До установки убедитесь, чтобы напряжение и частота линии электропитания соответствовали данным, указанным на паспортной табличке электронасоса, и чтобы потребление тока было ниже максимального тока сети.
- Максимальное отклонение от значения номинального паспортного напряжения составляет ± 5%
- Допустимый дисбаланс фазных напряжений: макс 2%
- Предохранители и защитные выключатели должны обладать свойствами, соответствующими характеристикам системы.
- Для защиты двигателя электронасоса используйте защитный выключатель, подходящий для электрических характеристик, указанных на паспортной табличке.
- Убедитесь, что тепловые защиты были всегда правильно подключены. Отсутствие подключения тепловой защиты не только отменяет действие гарантии, но и может создавать опасные условия.
- Рабочие характеристики и электрическая безопасность электронасосов ZENIT гарантированы в их заводской конфигурации. Любое изменение (напр., удлинение фирменного провода другим проводом) может вызвать ухудшение характеристик электронасоса.

Перед установкой и перед первым пуском в эксплуатацию убедитесь, что электрические кабели не имеют каких-либо повреждений, чтобы не допустить короткого замыкания.

4.2 Провода

- Убедитесь, что электрические провода не были повреждены ни коим образом, и что на их концы не попали ни влага, ни вода.
- Свободные концы проводов должны подключаться к сертифицированному электрическому щиту со степенью защиты, подходящей для места его установки.
- Закрепите электрические провода так, чтобы они были защищены от случайного скручивания, разрыва и/или раздавливания.
- В случае повреждения электрического провода не заменяйте его, а обратитесь в компанию Zenit или в уполномоченный сервисный центр.
- Не недооценивайте проблемы, связанные с падением напряжения.

Свободные концы проводов должны подключаться к электрическому щиту, сертифицированному для потенциально взрывоопасной атмосферы, если он установлен в опасной зоне.

4.3 Заземление

- Проверьте наличие и эффективность системы заземления и дифференциального выключателя.
- Убедитесь, что длина заземляющего проводника превышает приблизительно на 150 мм длину остальных проводников так, чтобы он отсоединился в последнюю очередь от щита при случайном отрыве.

Имеющаяся наружная точка подключения проводника заземления позволяет подключать провода с сечением не менее 4 мм².

Не подключайте провод заземления к газовым, водопроводным трубам, молниеотводам или же телефонным проводам. Неправильное подключение к заземлению может привести к поражению током.

На моделях -Ex убедитесь, что наружный провод заземления (желто-зеленый, с сечением не менее 4 мм²) подключен к наружной клемме заземления на насосе при помощи надежного зажима.
Очистите соединительную поверхность наружной клеммы заземления перед установкой зажима.

4.4 Тепловая защита

Насос оборудован тепловой защитой внутри обмоток статора, чтобы отключать питание в случае перегрева двигателя.
Стандартная тепловая защита состоит из биметаллических теплозащитных устройств с номинальной температурой переключения NST = 150 °C.
В качестве опции биметаллические защитные средства могут быть заменены термисторами PTC или датчиками PT100.
Провода тепловой защиты обозначены биркой с надписью “TP = THERMAL PROTECTION”, и они должны подключаться к соответствующим клеммам электрического щита управления.

Подключение тепловой защиты к электрическому щиту является обязательным. Электрический щит должен быть подготовлен для остановки двигателя в случае срабатывания внутренней тепловой защиты. Должен быть исключен автоматический перезапуск электронасоса, который должен осуществляться лишь только оператором вручную, после устранения причин неисправности.

4.5 Датчик влажности

Электронасос может быть оборудован одноэлектродным датчиком влажности для обнаружения и сигнализации просачивания воды в масляную камеру сальников (проводник заземления используется в качестве линии возврата сигнала для определения порога проводимости).
При подаче сигнала прекратите эксплуатацию насоса и выполните обслуживание.
Кабель сигнала имеет этикетку с буквой **S.**

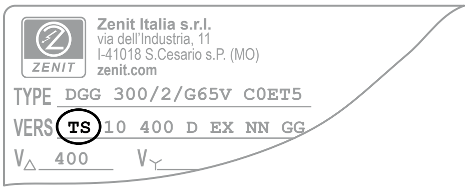
Для установки моделей с сертификатом -Ex подключение к электрощиту должно выполняться, помещая в безопасную зону барьер искрозащиты с гальванической изоляцией.

Электрические характеристики датчика искрозащиты:
Датчик U_i: 30 В; I_i: 120 мА; P_i: 1.3 Вт
C_i: 0,3 нФ; L_i: ~ 0 мГ
Кабель C_c: 200 пФ/м; L_c: 1 мкГ/м; L_c/R_c= 30 мкГ/Ом

4.6 Электрическое подключение

Для выполнения электрического подключения электронасоса действуйте следующим образом:

1. Проверьте по паспортной табличке нужный тип электрического подключения (поле VERS) **(Рис. 18)**.
2. Подключите проводник заземления к соответствующей клемме на электрическом щите, в соответствии со схемой подключения.
3. Подключите кабели питания к соответствующим клеммам на электрическом щите, в соответствии со схемами подключения.
4. Подключите проводники контрольных устройств к соответствующим клеммам на электрическом щите.


ZENIT
Zenit Italia s.r.l.
via dell'Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400
V⅄

18

ПРИМ.: строго соблюдайте подключения, указанные в схемах цепей
Для электрических подключений датчиков и нестандартных защитных устройств обращайтесь к специальной документации, поставляемой вместе с насосом

СХЕМЫ ПОДКЛЮЧЕНИЯ НА СТРАНИЦЕ 123

5. ВВОД В ЭКСПЛУАТАЦИЮ

ВНИМАНИЕ! Перед выполнением любых операций проверяйте, чтобы электронасос и электрический щит были отключены от электрической системы и не могли случайно включиться.

Перед запуском насоса убедитесь, что:

- в камере сальников имеется масло (см. параграф 6.5.3)
- крыльчатка свободно вращается
- оборудование правильно и надежно установлено
- установленные устройства мониторинга правильно подключены

5.1 Общие предупреждения по безопасности

- Все операции должны выполняться компетентными специалистами.
- Электронасос необходимо всегда использовать с установленными и исправно работающими предохранительными устройствами.
- Держите предметы и людей на безопасном расстоянии от установленных изделий, и не допускайте контакта людей и животных с жидкостью, в которую погружены электронасосы.
- Убедитесь, что вращение крыльчатки является правильным, следуя описанной в руководстве процедуре.

5.2 Запуск

Насосы не следует запускать, если атмосфера в ванне является потенциально опасной.

Завершив установку, рекомендуется провести испытание системы и убедиться в ее безупречной работе.
Насос необходимо всегда использовать с установленными и исправно работающими предохранительными устройствами. Убедитесь, что все защитные устройства были правильно подключены.
Насос не должен работать всухую. Убедитесь, что уровень жидкости выше двигателя.
Если установлены задвижки, то убедитесь, что они открыты.
Включите питание и позвольте насосу немного поработать, чтобы:

- убедиться, что потребляемый ток находится в пределах, указанных на паспортной табличке;
- убедиться, что системы наблюдения работают исправно (отсутствие аварийных сигналов или предупреждений);
- проверить, что настройка уровней включения и выключения (минимальные и максимальные уровни) является правильной.

ВНИМАНИЕ! Чтобы предотвратить нанесение ущерба двигателю, должно соблюдаться максимально разрешенное количество запусков в час.

ВНИМАНИЕ! В случае обнаружения аномальных звуков или вибрации насоса, неисправностей, аварийных сигналов или предупреждений, немедленно остановите насос и не включайте его до тех пор, пока не будет обнаружена и устранена причина аномалии.

5.3 Уровень звукового давления

Уровень звукового давления работающего электронасоса составляет менее 70 дБ.
Тем не менее, этот порог может быть превышен в некоторых установках и в определенных точках на графике рабочих характеристик.
Проверьте допустимый уровень звукового давления в помещении, где установлено изделие, чтобы не допускать нарушения местных законов.

6. ОБСЛУЖИВАНИЕ И ТЕХПОМОЩЬ

6.1 Вступление

Периодические обслуживание и осмотр являются необходимыми для сохранения характеристик насоса. По этой причине система должна периодически чиститься, проходить капремонт и осматриваться.
В том случае, если в работе насоса отмечаются отличия от обычных рабочих условий, следует обращаться к главе "7. Поиск и устранение неисправностей" данного руководства и предпринимать своевременные действия по устранению неисправностей.

ВНИМАНИЕ! Инструкции по контролю и обслуживанию этих насосов не предназначены для выполнения неквалифицированных работ собственными силами, а требуют специальных технических знаний.

ПРИМЕЧАНИЕ: Проверка и замена компонентов требует использования специального оборудования.
Для выполнения этих операций обращайтесь к дилеру, у которого было приобретено изделие, или же в отдел продаж компании ZENIT в вашем регионе.

Проверка и ремонт оборудования -Ex должны выполняться в соответствии со следующими стандартами:

- **EN 60079-17: Взрывоопасные среды - Часть 17: Проверка и техническое обслуживание электроустановок**
- **МЭК 60034-23: Машины электрические вращающиеся - Часть 23: Ремонт, капитальный ремонт и восстановление**
- **EN 60079-19: Взрывоопасные среды - Часть 19: Ремонт, проверка и восстановление электрооборудования**

Любые работы на электронасосах в версии -Ex должны выполняться квалифицированным специалистом, в сертифицированном сервисном центре -Ex (в соответствии с международными и/или местными нормами) или же в сервисном центре Zenit, используя лишь только фирменные запасные части. Несоблюдение этого требования вызывает отмену сертификата -Ex.

6.2 Общие предупреждения по безопасности

- Перед выполнением каких-либо действий с насосом, установленным во вредных для здоровья жидкостях, произведите тщательную очистку насоса, емкости и т.д., в соответствии с местными требованиями.
- Перед выполнением очистки и/или обслуживания компетентный специалист должен отключить насос, перекрыв его питание, и убедиться, что насос не может самопроизвольно включиться.
- Всегда отсоединяйте в первую очередь фазовые проводники, а затем желто-зеленый провод заземления.
- Убедитесь, что насос не может упасть или укатиться, нанося ущерб имуществу или людям.
- Перед выполнением работ с насосом промойте его поверхность большим количеством чистой воды и/или специальных моющих средств.
- В результате продолжительного использования поверхность насоса может сильно нагреться. Чтобы предотвратить ожоги, остудите ее должным образом.
- Всегда соблюдайте правила техники безопасности, действующие в месте установки, возможные местные нормы и принципы общего здравого смысла.

6.3 Плановое обслуживание и техпомощь

Периодичность работ обслуживания зависит от типа установки, от рабочей нагрузки насоса и от характеристик жидкости, в которую он погружен. При выполнении работ по плановому обслуживанию или в любом случае, когда характеристики насоса ухудшатся, или вибрация или шум становятся выше изначальных, необходимо осуществить проверку деталей, подверженных износу. В этих целях свяжитесь с уполномоченным сервисным центром.

Периодичность	Тип проверки	
	Стандартная модель	**Модель -Ex**
Еженедельно	Убедитесь, что потребляемый ток находится в пределах номинальных значений.	
	Проверяйте, чтобы напряжение питания находилось в пределах ± 5% от номинального значения.	
Ежемесячно	Проверка насоса: Если характеристики насоса существенно снизились, то крыльчатка может быть засорена или заблокирована загрязнением. Удалите загрязнение и при наличии замените поврежденные части. Проверка кабелей: смотрите параграф 6.5.1 "Проверка электрических кабелей". Измерение сопротивления изоляции: ссылочное значение сопротивления изоляции = мин. 20 МОм *ПРИМЕЧАНИЕ: Двигатель должен быть подвержен проверке, если значение прочности изоляции существенно ниже измеренного во время предыдущей проверки.*	
Раз в 6 месяцев или через 3000 часов, в зависимости от того, что наступит ранее	Проверка и чистка подъемной цепи или троса: - Заменить в случае повреждения, коррозии или износа - Удалить посторонние тела	
	Проверяйте лебедки, крюки и цепи, если они обнаруживают признаки износа, повреждений или коррозии. В случае необходимости очистите и смажьте их и замените изношенные компоненты. В случае необходимости удалите посторонние тела.	
	Убедитесь, что винты, гайки и болты правильно затянуты. Затяните болты и, при необходимости, замените резьбовой фиксатор.	
	При каждом опорожнении ванны проверяйте донные крепления.	
		Проверьте кабели, масло, сальники, подшипники, изнашивающиеся части (крыльчатка, всасывающий фланец и т.д.). Если в масле содержится вода, то проверьте сальники. Смотрите параграф 6.5.3 "Процедура проверки и замены масла". *ПРИМЕЧАНИЕ: всегда заменяйте компоненты из резины (уплотнительные кольца, прокладки), если насос разбирается во время проверки.*
Ежегодно	Проверьте кабели, масло, сальники, подшипники, изнашивающиеся части (крыльчатка, всасывающий фланец и т.д.). Если в масле содержится вода, то проверьте сальники. Смотрите параграф 6.5.3 "Процедура проверки и замены масла". *ПРИМЕЧАНИЕ: всегда заменяйте компоненты из резины (уплотнительные кольца, прокладки), если насос разбирается во время проверки.*	
Раз в 2 года или через 9000 часов, в зависимости от того, что наступит ранее	Замена масла. *ПРИМЕЧАНИЕ: Для получения более подробной информации смотрите параграф "Процедура проверки и замены масла".*	
	Замена сальников. *ПРИМЕЧАНИЕ: Проверка и замена сальников требует применения специального оборудования. Для выполнения этих операций обратитесь к дилеру, у которого было приобретено оборудование, или же к вашему региональному дистрибьютору.*	
		Замена подшипников.
Раз в 2 - 5 лет	Капремонт: Насос должен пройти капремонт, даже если он исправно работает. В частности, может возникнуть необходимость в преждевременном капремонте, если насос эксплуатируется непрерывно.	

6.4 Чистка

Удалите грязь с поверхности насоса и промойте его проточной водой. Если гидравлическая часть засорена, то тщательно промойте ее. Обратите особенное внимание на гидравлическую часть и полностью удалите любое загрязнение.
Если насос применяется в условиях периодического использования, то после каждого применения необходимо промывать гидравлические компоненты для предотвращения образования отложений. Для этого необходимо, чтобы электронасос выполнил несколько циклов прокачки чистой воды.
Для обеспечения соблюдения пороговых уровней запуска и остановки рекомендуется также не допускать образование отложений на поплавках.

6.5 Проверки

Убедитесь, что насос не понес ущерба, и что винты, гайки и болты правильно затянуты. Затяните болты с правильным моментом затяжки (см. параграф 6.6), заменяя при необходимости резьбовой фиксатор.

6.5.1. Проверка электрических кабелей

Кабели и провода могут легко повредиться. Они должны периодически осматриваться, как только появляется возможность.
Убедитесь, что электрический кабель находится в целости, не раздавлен и не имеет порезов и следов износа.
Поврежденный кабель может стать причиной попадания жидкости в насос и вызвать рассеивание тока, короткое замыкание, поражение током и пожар.
Проверьте, чтобы кабельный прижим находился в сохранности.
Поврежденные или дефектные компоненты следует немедленно заменить.

6.5.2 Проверка подшипников

Все подшипники являются необслуживаемыми подшипниками качения.
Вращайте вал вручную, чтобы убедиться, что вращение плавное и не имеет аномального шума. В противном случае замените подшипники.

Неисправные подшипники могут отрицательно сказаться на безопасности -Ex

6.5.3 Процедура проверки и замены масла

Замена масла и осмотр сальников необходимы в том случае, если датчик влажности обнаружил попадание воды в масляную камеру.
Масляная камера спроектирована таким образом, чтобы при ее заполнении в вертикальном положении насоса, заливалось необходимое количество масла, когда его уровень доходит до заливного отверстия (масляная пробка).

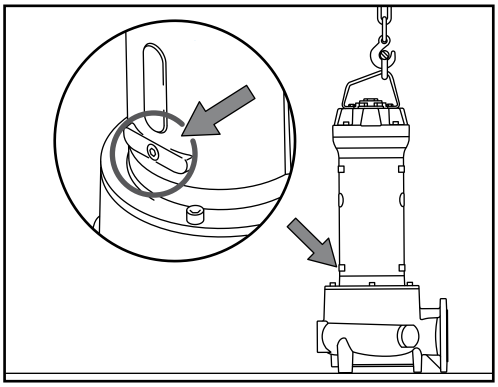
Используйте масло типа TOTAL Bio Hydraulic TMP FR46 или эквивалент с классом вязкости ISO (кинематическая вязкость при 40°C) 40-90 сСт, температура вспышки ≥ 240°C

В случае невозможности приобретения указанного масла, обратитесь в компанию Zenit.

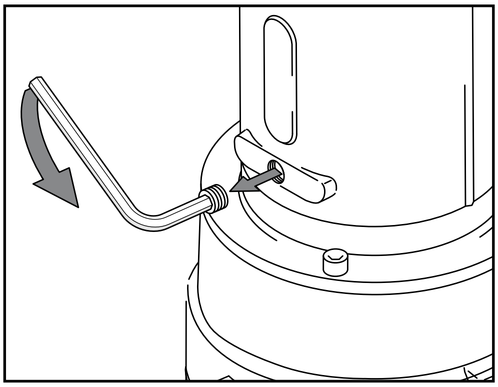
Внутри масляной камеры сможет образоваться избыточное давление, вызванное возможной течью сальника. Медленно отвинчивайте пробку, накрыв ее тряпкой подходящих размеров.

Не сливайте масло, загрязняя окружающую среду, а сдайте его в специализированный центр сбора.

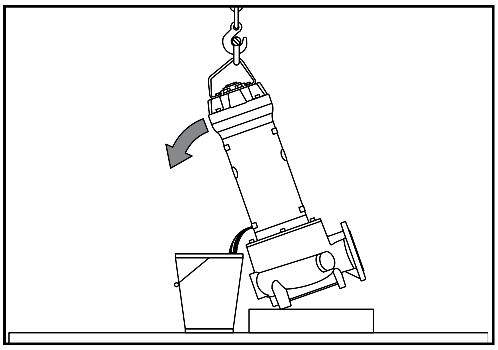
Процедура замены масла
Тип корпуса G05M - G05L - G06S - G06L - G07S - G07L - G08L - G10S - G10L



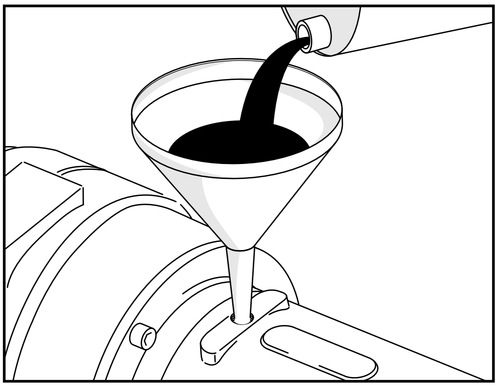
1. Установите электронасос на ровную и прочную поверхность.
   Используйте пригодное подъемное средство с подходящими характеристиками.Закрепите насос, чтобы не допустить его поворачивание или раскачивание.
2. Найдите пробки масляной камеры электронасоса.



3. Отвинтите пробку масляной камеры

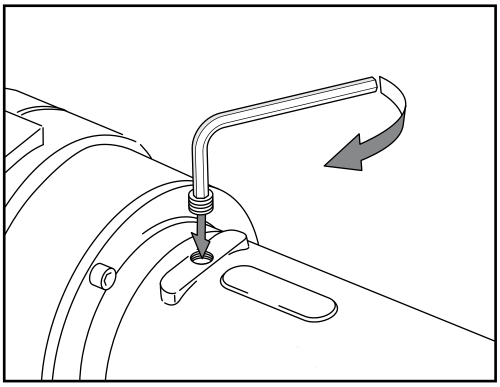


4. Слейте масло в емкость соответствующего объема, желательно прозрачную.
5. Поставьте емкость с маслом на горизонтальную поверхность и подождите несколько минут, чтобы содержащаяся в масле вода осела на дно:
   - Чистое масло без воды: сальник находится в хорошем состоянии и можно заправлять свежим маслом.
   - Масло с минимальным содержанием воды: может быть вызвано усадкой сальника в течение первых часов работы, поэтому, это явление не имеет значения.
   - Масло с водой и примесями: проверить сальник, который должен быть заменен новым. Замена должна выполняться в уполномоченном сервисном центре.



6. Положите насос горизонтально на верстак
7. Заполните камеру сальников биоразлагающимся маслом

Тип корпуса	Количество масла в камере сальников (мл)
G05M	140
G05L	215
G06S - G06L	310
G07S - G07L	370
G08L	570
G10S - G10L	1800

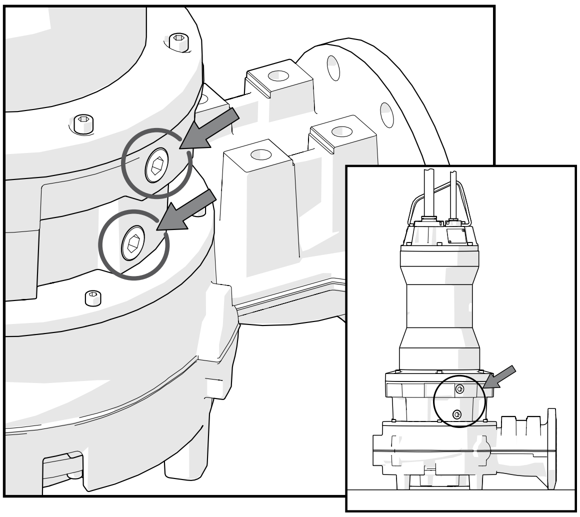


8. Завинтите пробку масляной камеры.

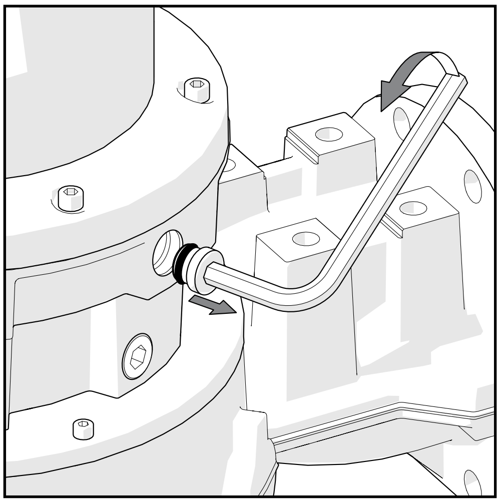
ВНИМАНИЕ! **Используйте резьбовой фиксатор Loctite 243.**

Тип корпуса	Масляная пробка
G05M - G05L **G06S - G06L** **G07S - G07L** **G08L**	1/8” NPT
G10S - G10L	3/8” DIN 906

Процедура замены масла
Тип корпуса M08S - M08L

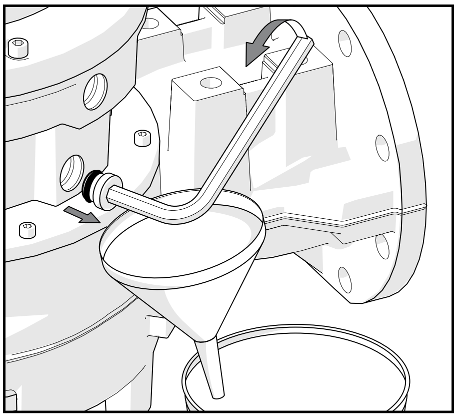


1. Установите электронасос на ровную и прочную поверхность. Используйте пригодное подъемное средство с подходящими характеристиками.Закрепите насос, чтобы не допустить его поворачивание или раскачивание.
2. Найдите пробки масляной камеры электронасоса.

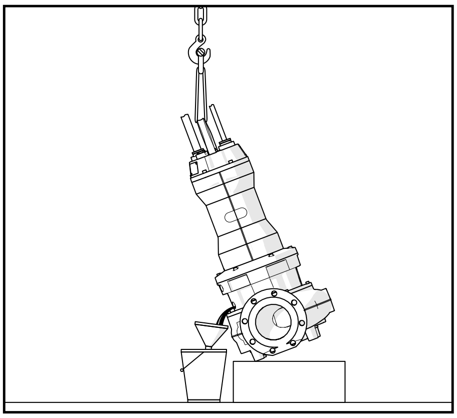


3. Отвинтите верхнюю пробку масляной камеры.

RU

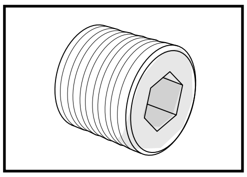


4. Отвинтите нижнюю пробку масляной камеры.



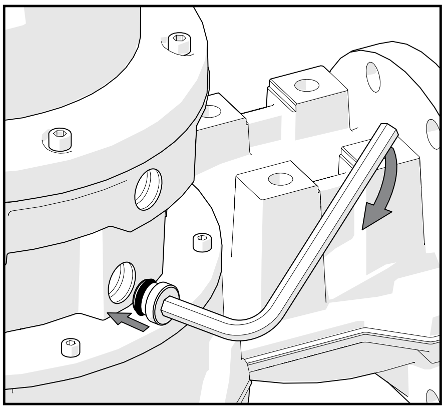
5. Слейте масло в емкость соответствующего объема, желательно прозрачную.
ПРИМЕЧАНИЕ: чтобы проверить, достаточен ли объем используемой емкости, см. Таблицу объема масла, содержащегося в камере.

6. Поставьте емкость с маслом на горизонтальную поверхность и подождите несколько минут, чтобы содержащаяся в масле вода осела на дно:
- Чистое масло без воды: сальник находится в хорошем состоянии и можно заправлять свежим маслом.
- Масло с минимальным содержанием воды: может быть вызвано усадкой сальника в течение первых часов работы, поэтому, это явление не имеет значения.
- Масло с водой и примесями: проверить сальник, который должен быть заменен новым. Замена должна выполняться в уполномоченном сервисном центре.

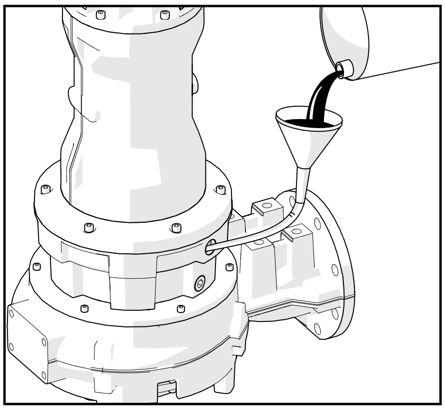


Тип корпуса	Пробка масляной камеры
M08S - M08L	2x 3/8” DIN 906

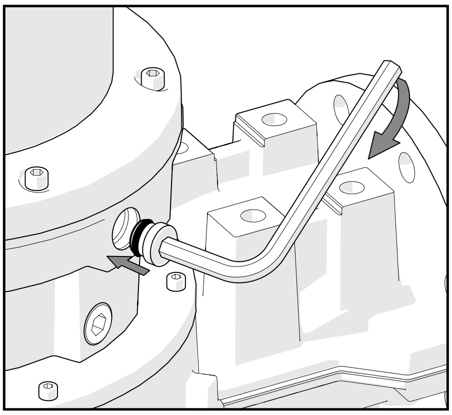
ВНИМАНИЕ! **Используйте резьбовой фиксатор Loctite 243.**



7. Завинтите нижнюю пробку масляной камеры.



8. Заполните камеру сальников биоразлагающимся маслом



9. Завинтите верхнюю пробку масляной камеры.

Тип корпуса	Количество масла камера сальников (мл)
M08S - M08L	2300

6.6 Крепеж

В случае замены используйте крепеж класса A2 70, A2 80, A4 70 или A4 80, в соответствии со стандартом ISO 3506-1.

Моменты затяжки (Нм)

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

7. УТИЛИЗАЦИЯ

Правильно утилизируйте изделие, отделяя друг от друга различные компоненты и сдавая их в центры сбора вторсырья.
Пользуйтесь частными или государственными услугами утилизации отходов, в соответствии с действующими местными нормами.

Приведенный на оборудовании или на упаковке символ перечеркнутого мусорного бака обозначает, что в конце срока службы изделие должно утилизироваться отдельно от смешанных бытовых отходов.

Правильный раздельный сбор отходов для последующей отправки оборудования на повторное использование, обработку и экологически совместимую утилизацию способствует предотвращению отрицательного воздействия на окружающую среду и здоровье, а также стимулирует повторное использование материалов, из которых изготовлено оборудование.
Неправильная утилизация изделия пользователем приводит к наложению административных взысканий, предусмотренных местными нормами.

8. ПОИСК И УСТРАНЕНИЕ НЕИСПРАВНОСТЕЙ

	Неисправность	**Возможная причина**	**Решение**
1	Насос не запускается или же запускается, но сразу же останавливается	Неправильное или недостаточное питание (напр., отключение электроснабжения, падение напряжения и т.д.)	Обратитесь к опытному специалисту
		Отключен или поврежден кабель	Проверьте сохранность кабеля, а также правильность подключения к сети
		Неисправность электрического щита	Обратитесь к опытному специалисту для обнаружения причины неисправности
		Предохранители перегорели	Проверьте тип предохранителей и замените их другими, с аналогичными характеристиками
		Срабатывание термомагнитной защиты	см. Пункт 2
		Срабатывание тепловой защиты	см. Пункт 3
		Аварийный сигнал датчика влажности	см. Пункт 4
		Срабатывание выключателя дифференциальной защиты (RCD)	см. Пункт 5
		Конденсатор поврежден или неправильно подключен (двигатель ~1)	Обратитесь к опытному специалисту для замены конденсатора и проверки правильности подключения
		Срабатывание датчика уровня	Проверьте правильность подключения и работу датчика уровня
2	Срабатывание термомагнитного выключателя	Слишком низкое напряжение питания или несбалансированные фазы.	Обратитесь к опытному специалисту
		Неправильное электрическое подключение	Обратитесь к опытному специалисту для проверки и исправления электрического подключения
		Реле избыточного тока настроено на слишком низкое значение или же повреждено	Проверьте реле избыточного тока. Настройте реле на указанное в паспортной табличке значение тока
		Короткое замыкание обмотки	Обратитесь в уполномоченный сервисный центр
		Гидравлическая часть заблокирована посторонними телами	Произведите очистку гидравлической части и устраните блокировку
		Ротор заблокирован	Обратитесь в уполномоченный сервисный центр
3	Тепловая защита срабатывает после непродолжительного периода работы	Насос погружен в слишком горячую жидкость	Понизьте температуру жидкости
		Гидравлическая часть заблокирована посторонними телами	Произведите очистку гидравлической части и устраните блокировку
		Повреждены внутренние части	Обратитесь в уполномоченный сервисный центр
		Неправильное напряжение	Убедитесь, что напряжение питания соответствует указанному на табличке
		Неисправные или изношенные подшипники	Обратитесь в уполномоченный сервисный центр
		Слишком большое количество запусков в час	см. Пункт 6
4	Срабатывание выключателя дифференциальной защиты (RCD)	Влага в двигателе	Обратитесь в уполномоченный сервисный центр
		Плохая изоляция двигателя	Обратитесь в уполномоченный сервисный центр
		Кабель поврежден	Проверьте сохранность кабеля питания и обратитесь в сервисный центр для замены в случае необходимости

5	Насос работает, но со сниженной или нулевой производительностью	Гидравлическая часть заблокирована посторонними телами	Произведите очистку гидравлической части и устраните блокировку
		Напорная труба засорена посторонними телами	Произведите чистку напорной трубы
		Стопорный клапан заклинил	Произведите чистку стопорных клапанов
		Задвижка частично закрыта или заблокирована	Откройте и при необходимости очистите задвижку
		Крыльчатка вращается в противоположном направлении	Проверьте направление вращения и поменяйте местами электрическое подключение двух фаз
		Утечки из системы	Проверьте систему и устраните причину течей
		Неправильный выбор насоса	Замените насос на подходящий
6	Слишком большое количество запусков в час	Неправильная настройка датчиков уровня	Исправьте настройку датчиков уровня
		Неисправность датчиков уровня	Проверьте правильность работы датчиков
		Турбулентность рядом с датчиками уровня	Устраните причины турбулентности или измените положение датчиков уровня
		Слишком маленький колодец	Измените размеры колодца
7	Наличие вибрации или чрезмерный шум	Повреждены внутренние части	Обратитесь в уполномоченный сервисный центр
		Неисправные или изношенные подшипники	Обратитесь в уполномоченный сервисный центр
		Крыльчатка засорена, разбалансирована или же повреждена	Обратитесь в уполномоченный сервисный центр
		Крыльчатка заклинила	Очистите крыльчатку и устраните причину блокировки
		Крыльчатка вращается в противоположном направлении	Проверьте направление вращения и поменяйте местами электрическое подключение двух фаз
		Отсутствие фазы	Обратитесь к опытному специалисту
		Колебания системы	Проверьте систему
8	Насос работает, но потребляет много энергии	Неправильная рабочая точка	Убедитесь, что насос работает в пределах его рабочего поля
		Неправильное напряжение питания	Восстановите напряжение питания на значение в паспортной табличке
		Гидравлическая часть заблокирована посторонними телами	Произведите очистку гидравлической части и устраните блокировку
		Неисправные или изношенные подшипники	Обратитесь в уполномоченный сервисный центр
		Крыльчатка вращается в противоположном направлении	Проверьте направление вращения и поменяйте местами электрическое подключение двух фаз
		Неисправность обмотки статора	Обратитесь в уполномоченный сервисный центр
9	Обнаружение течей	Протечка воды в двигатель из-за повреждения кабелей, уплотнительных колец или кабельных муфт	Обратитесь в уполномоченный сервисный центр
		Протечка воды в масляную камеру из-за износа или неисправности сальников или уплотнительных колец	

Для проведения ремонта или же для иных запросов необходимо предоставить следующую информацию об изделии:

Модель	**Заводской номер**	**Дата покупки**
Примечания:		

IT COLLEGAMENTO ELETTRICO
EN ELECTRICAL CONNECTIONS
FR BRANCHEMENTS ÉLECTRIQUES
DE ELEKTRISCHE ANSCHLÜSSE
ES CONEXIONES ELÉCTRICAS
RU СХЕМЫ ЭЛЕКТРИЧЕСКИХ СОЕДИНЕНИЙ

	L1 - L2 - L3	U1 - U2 V1 - V2 W1 - W2	TP	S	CR	CS	PE	AYC
IT	Alimentazione trifase	Terminali motore	Protezione termica	Sonda di umidità	Condensatore di marcia	Condensatore di spunto	Terra	A vostra cura
EN	Three-phase power supply	Motor terminals	Thermal protection	Leakage detector	Run capacitor	Startup capacitor	Ground	At your care
FR	Alimentation triphasée	Bornes moteur	Protection thermique	Sonde d’humidité	Condensateur de marche	Condensateur de démarrage	Terre	Par vos soins
DE	Drehstromversorgung	Motorklemmen	Thermischer Schutz	Wasser-im-Öl-Sensor	Betriebskondensator	Anlaufkondensator	Erde	In Ihrer Pflege
ES	Alimentación trifásica	Terminales del motor	Protección térmica	Sonda de humedad	Condensador de marcha	Condensador de arranque	Tierra	Por cuenta del usuario
RU	Трехфазное питание	Терминалы двигателя	Тепловая защита	Датчик влажности	Конденсатор хода	Конденсатор пикового момента	Заземление	Выполняется вами

IT Colore cavi
EN Cable colors
FR Couleur des câbles
DE Kabelfarben
ES Color de los cables
RU Цвет кабелей

	IT	EN	FR	DE	ES	RU
N	Nero	Black	Noir	Schwarz	Negro	Черный
M	Marrone	Brown	Marron	Braun	Marrón	Коричневый
G	Grigio	Grey	Gris	Grau	Gris	Серый
B	Blu	Blue	Bleu	Blau	Azul	Синий
GV	Giallo/Verde	Yellow/Green	Jaune/Vert	Gelb/Grün	Amarillo/Verde	Желто-зеленый
BV	Blu/Verde	Blue/Green	Bleu/Vert	Blau/Grün	Azul/Verde	Сине-желтый
MV	Marrone/Verde	Brown/Green	Marron/Vert	Braun/Grün	Marrón/Verde	Коричнево-зеленый
NV	Nero/Verde	Black/Green	Noir/Vert	Schwarz/Grün	Negro/Verde	Черно-зеленый

IT **ATTENZIONE!** In caso di differenze nel colore dei conduttori contattare il distributore presso cui è stato acquistato il prodotto o l’ufficio vendite ZENIT della vostra zona.

EN **WARNING!** In case of discrepancies of the wires color, contact the dealer where this equipment was purchased, or the ZENIT sales office in your area.

FR **ATTENTION !** Si la couleur des conducteurs ne correspond pas, contacter le revendeur où a été acheté le produit ou contacter le bureau commercial ZENIT de la région.

DE **ACHTUNG!** Bei abweichenden Aderfarben ist der Händler, bei dem das Produkt gekauft wurde, oder das nächste ZENIT Vertriebsbüro zu kontaktieren.

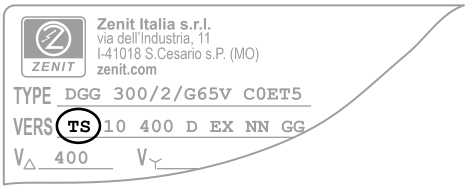
ES **¡ATENCIÓN!** En caso de disconformidades en el color de los conductores, póngase en contacto con el distribuidor donde compró el producto o con la oficina de ventas de ZENIT de su zona.

RU **ВНИМАНИЕ!** В случае несоответствия цвета проводников обращайтесь к дилеру, у которого было приобретено изделие, или же обращайтесь в отдел продаж компании ZENIT в вашем регионе.

IT Varianti elettriche
EN Electrical variant
FR Variantes électriques
DE Elektrische Varianten
ES Variantes eléctricas
RU Электрические варианты

(~1) **T, TSC, TSCD**

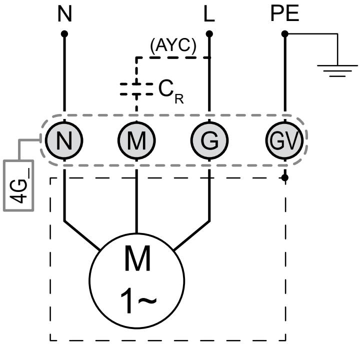
(~3) **NAE, TR, TRG, T, TS**

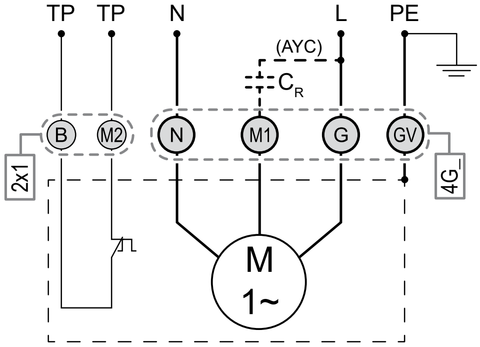

Zenit Italia s.r.l.
via dell’Industria, 11
I-41018 S.Cesario s.P. (MO)
zenit.com
TYPE DGG 300/2/G65V C0ET5
VERS TS 10 400 D EX NN GG
V△ 400 V⋎

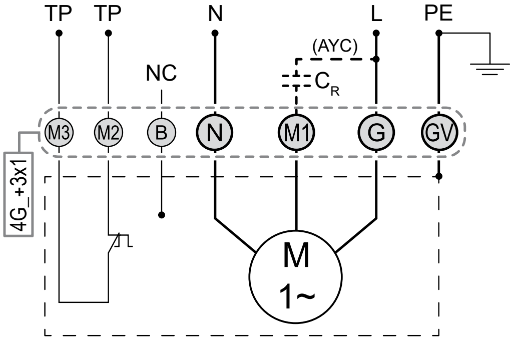
~1 50/60Hz

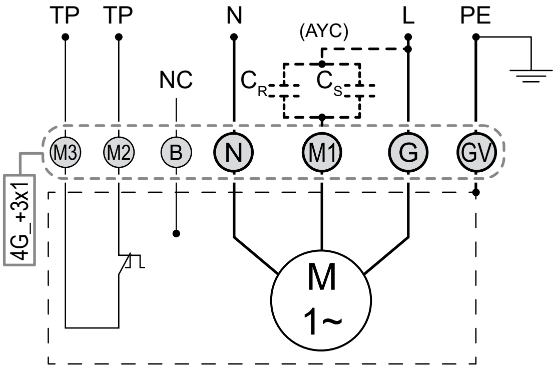
IT	**Cavo standard S1RN8-F**	DE	**Standardkabel S1RN8-F**
EN	**S1RN8-F standard cable**	ES	**Cable estándar S1RN8-F**
FR	**Câble standard S1RN8-F**	RU	**Стандартный кабель S1RN8-F**

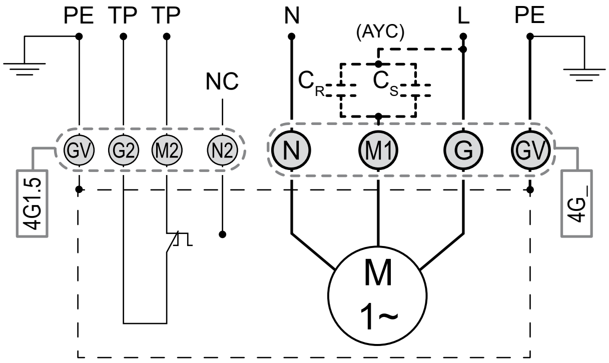
T


N
L
PE
(AYC)
C_R
N
M
G
GV
4G_
M
1~

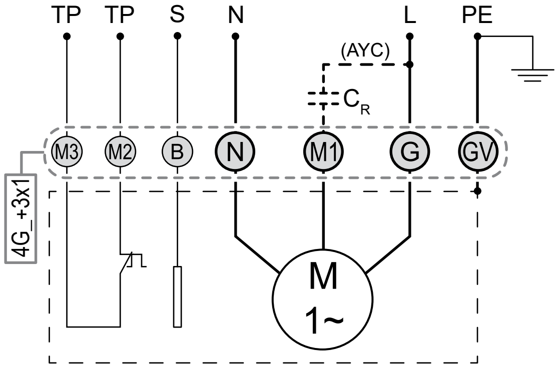

TP
TP
N
L
PE
(AYC)
C_R
B
M2
N
M1
G
GV
2x1
4G_
M
1~


TP
TP
N
L
PE
NC
(AYC)
C_R
M3
M2
B
N
M1
G
GV
4G_+3x1
M
1~

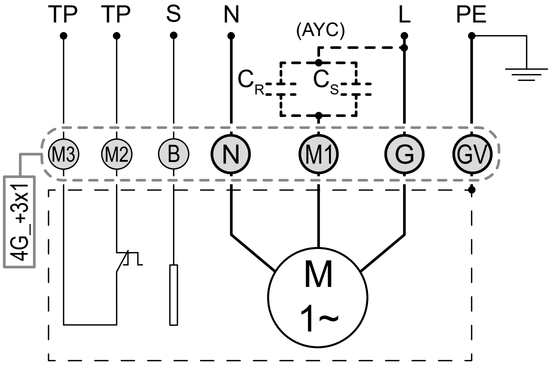

TP
TP
N
L
PE
NC
(AYC)
C_R
C_S
M3
M2
B
N
M1
G
GV
4G_+3x1
M
1~

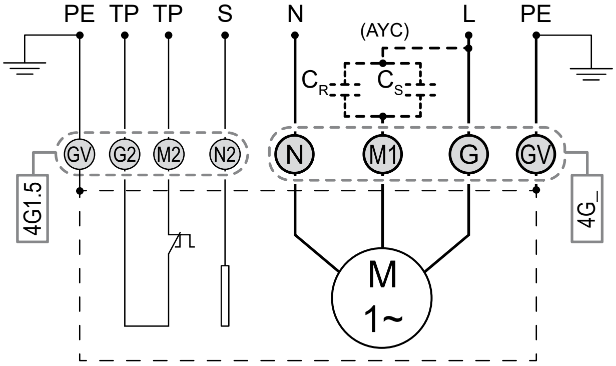

PE
TP
TP
N
L
PE
NC
(AYC)
C_R
C_S
GV
G2
M2
N2
N
M1
G
GV
4G1.5
4G_
M
1~

TSC


TP
TP
S
N
L
PE
(AYC)
C_R
M3
M2
B
N
M1
G
GV
4G_+3x1
M
1~

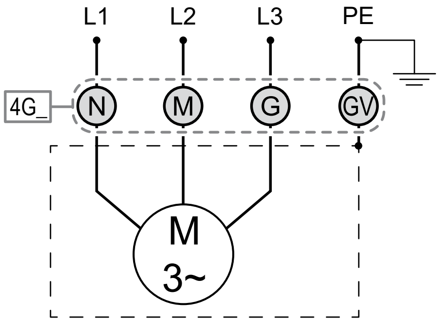
TSCD


TP
TP
S
N
L
PE
(AYC)
C_R
C_S
M3
M2
B
N
M1
G
GV
4G_+3x1
M
1~

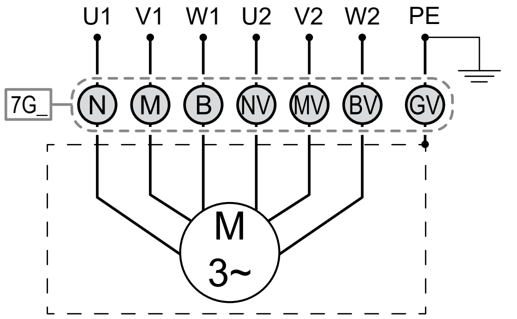

PE
TP
TP
S
N
L
PE
(AYC)
C_R
C_S
GV
G2
M2
N2
N
M1
G
GV
4G1.5
4G_
M
1~

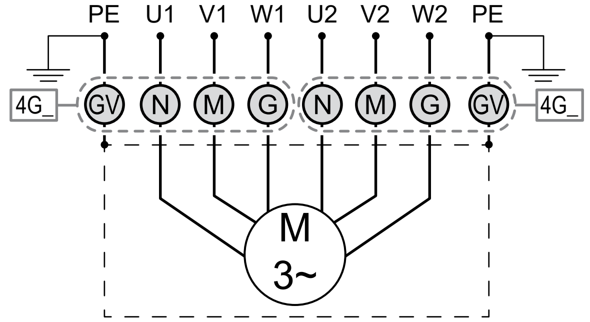
~3 50/60Hz

NAE, TR, TRG DOL (direct on line)

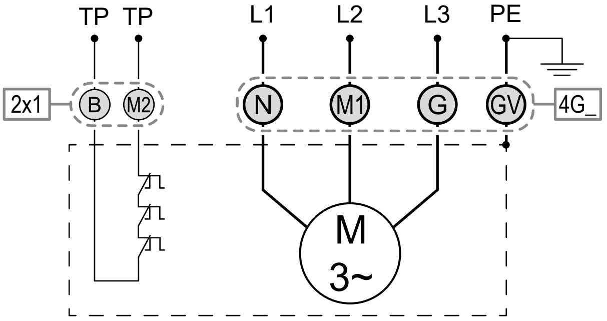

L1
L2
L3
PE
4G_
N
M
G
GV
M
3~

NAE Y/Δ


U1
V1
W1
U2
V2
W2
PE
7G_
N
M
B
NV
MV
BV
GV
M
3~


PE
U1
V1
W1
U2
V2
W2
PE
4G_
GV
N
M
G
N
M
G
GV
4G_
M
3~

T DOL (direct on line)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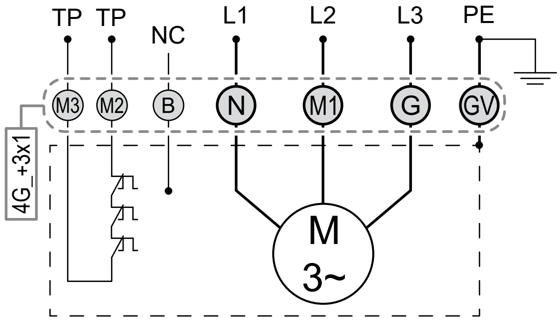
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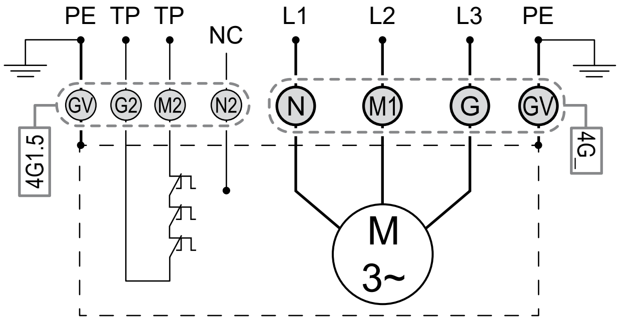
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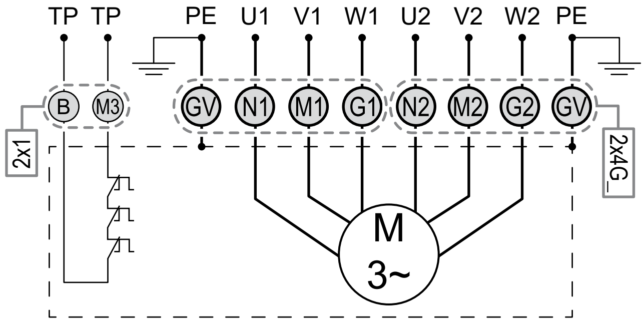
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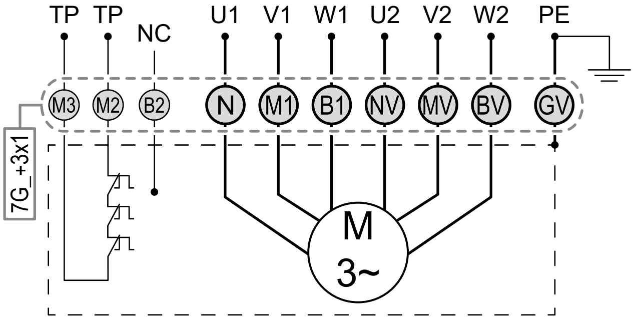
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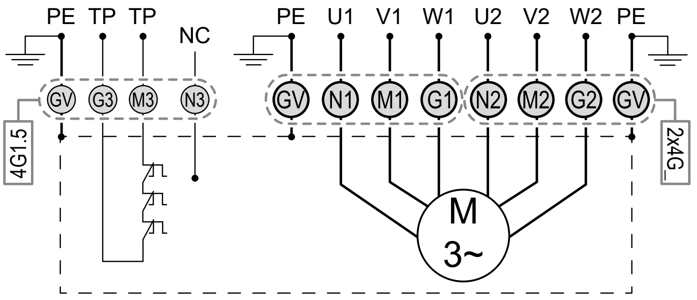
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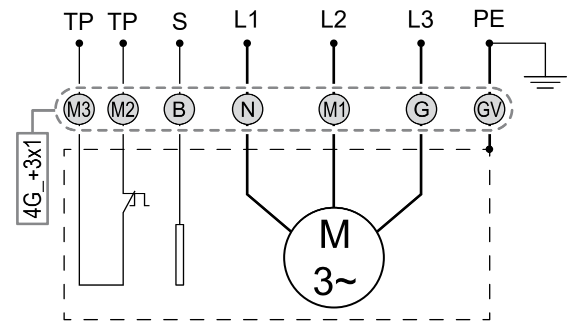
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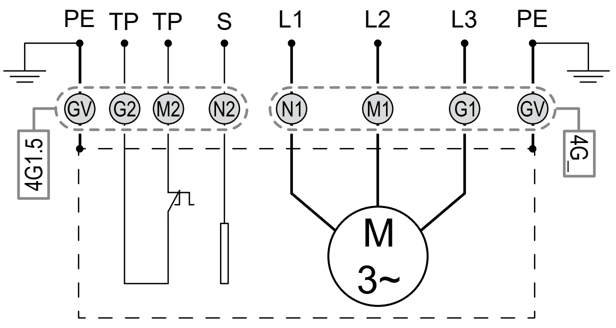
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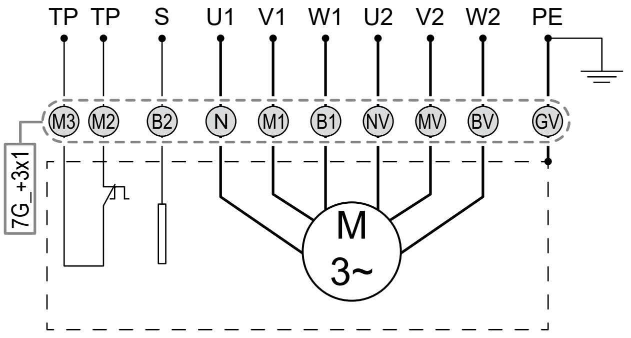
TS **Y/Δ**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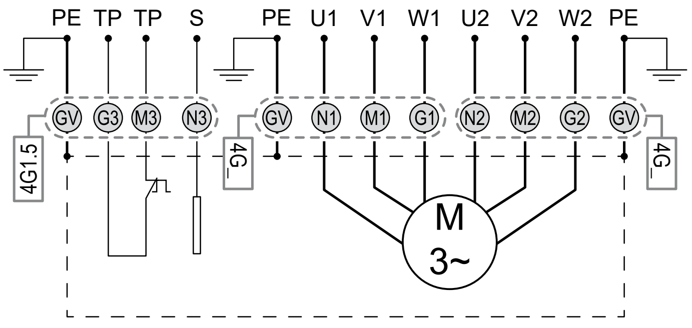
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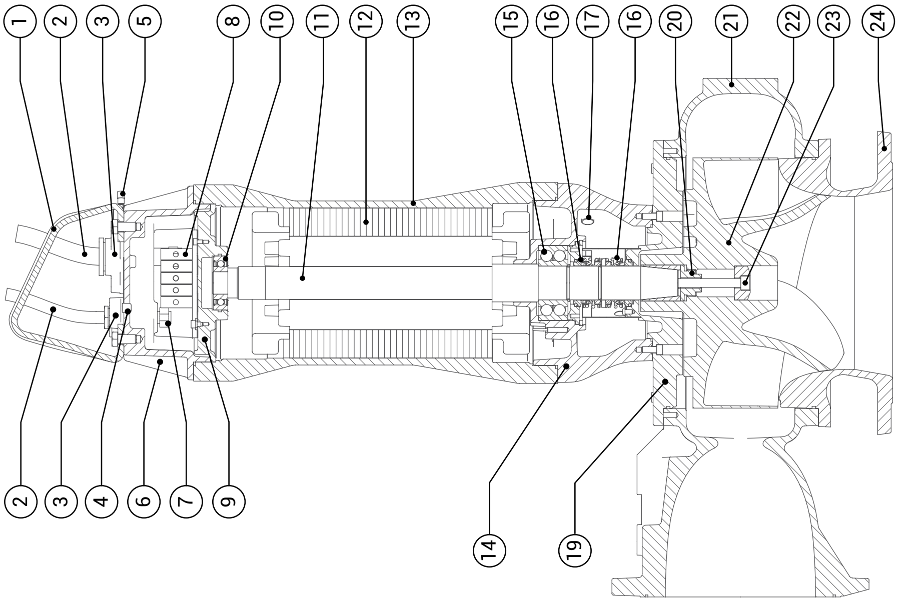
IT COMPONENTI PRINCIPALI
EN MAIN COMPONENTS
FR COMPOSANTS PRINCIPAUX
DE WICHTIGSTE BAUTEILE
ES COMPONENTES PRINCIPALES
RU ОСНОВНЫЕ КОМПОНЕНТЫ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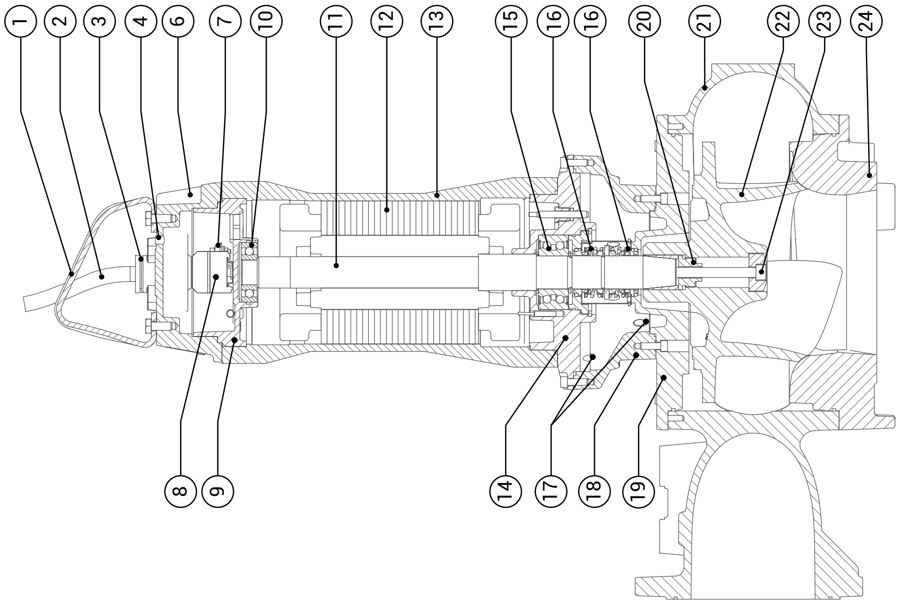
M08S/L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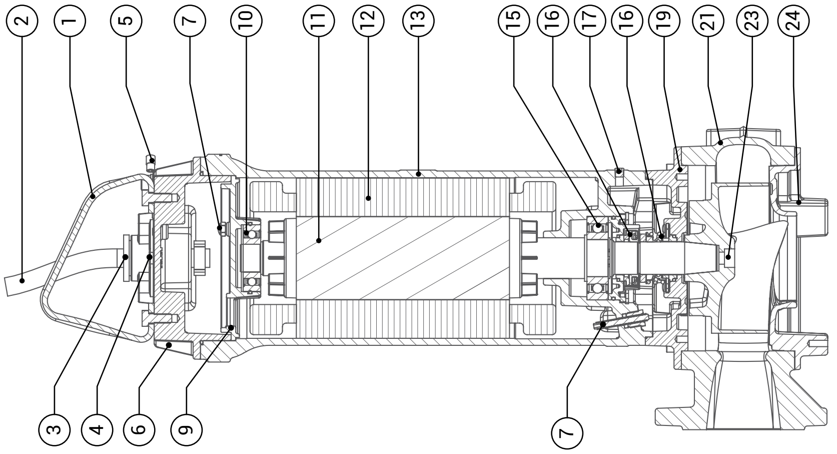
G10S/L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G05M/L - G06S/L - G07S/L - G08L

IT *Le immagini sono puramente indicative*
EN *The product's outline is purely illustrative*
FR *Les images sont purement indicatives*
DE *Die Abbildungen dienen nur der Veranschaulichung*
ES *Las imágenes únicamente tienen fines indicativos*
RU *Изображения являются лишь только приблизительными*

IT

	Descrizione	Materiale
1	Maniglia	Acciaio
2	Cavo	Gomma/Rame
3	Pressacavo	Ghisa/Acciaio
4	Tappo 1/8” NPT	Acciaio
5	Connessione di terra	Acciaio
6	Coperchio motore	Ghisa
7	Sonda	Acciaio
8	Morsettiera	Plastica/metallo
9	Supporto cuscinetto superiore	Ghisa
10	Cuscinetto superiore	Acciaio
11	Albero con rotore	Acciaio/Ferro/Alluminio
12	Statore	Ferro/Rame

13	Carcassa motore		Ghisa
14	Supporto cuscinetto inferiore		Ghisa
15	Cuscinetto inferiore		Acciaio
16	Tenuta meccanica		Gomma/metallo/SiC
17	Tappo olio	G05-G06-G07-G08: 1/8”NPT	Acciaio
		G10-M08: G3/8” DIN 906	Acciaio
18	Supporto intermedio		Ghisa
19	Piatto pompa		Ghisa
20	Boccola		Bronzo
21	Corpo pompa		Ghisa
22	Girante		Ghisa
23	Vite bloccaggio girante		Acciaio
24	Flangia di aspirazione		Ghisa

EN

	Description	Material
1	Handle	Steel
2	Cable	Rubber/Cupper
3	Cable gland	Steel
4	1/8” NPT blanking element	Steel
5	Earth connection	Steel
6	Motor cover	Cast iron
7	Probe	Steel
8	Terminal	Plastic/metal
9	Upper bearing support	Cast iron
10	Upper bearing	Steel
11	Shaft with rotor	Steel/Iron/Aluminium
12	Stator	Iron/Cupper

13	Motor case		Cast iron
14	Lower bearing support		Cast iron
15	Lower bearing		Steel
16	Mechanical seal		Rubber/metal/SiC
17	Oil plug	G05-G06-G07-G08: 1/8”NPT	Steel
		G10-M08: G3/8” DIN 906	Steel
18	Intermediate support		Cast iron
19	Pump plate		Cast iron
20	Bush		Bronze
21	Pump body		Cast iron
22	Impeller		Cast iron
23	Impeller fixing screw		Steel
24	Suction flange		Cast iron

FR

	Description	Matériau
1	Poignée	Acier
2	Câble	Caoutchouc/Cuivre
3	Presse-étoupe	Fonte/Acier
4	Bouchon 1/8” NPT	Acier
5	Connexion de terre	Acier
6	Couvercle moteur	Fonte
7	Sonde	Acier
8	Plaque à bornes	Plastique/Métal
9	Support roulement supérieur	Fonte
10	Roulement supérieur	Acier
11	Arbre rotor	Acier/Fer/Aluminium
12	Stator	Fer/Cuivre

13	Carcasse moteur		Fonte
14	Support roulement inférieur		Fonte
15	Roulement inférieur		Acier
16	Garniture mécanique		Caoutchouc/Métal/SiC
17	Bouchon huile	G05-G06-G07-G08: 1/8”NPT	Acier
		G10-M08: G3/8” DIN 906	Acier
18	Support intermédiaire		Fonte
19	Disque pompe		Fonte
20	Bague		Bronze
21	Corps de pompe		Fonte
22	Roue		Fonte
23	Vis blocage de roue		Acier
24	Bride d'aspiration		Fonte

DE

	Beschreibung	Material
1	Griff	Stahl
2	Kabel	Gummi/Kupfer
3	Kabeldurchführung	Gusseisen/Stahl
4	Verschluss 1/8” NPT	Stahl
5	Erdungsanschluss	Stahl
6	Motordeckel	Gusseisen
7	Sensor	Stahl
8	Klemmleiste	Kunststoff/Metall
9	Halterung oberes Wälzlager	Gusseisen
10	Oberes Wälzlager	Stahl
11	Welle mit Rotor	Stahl/Eisen/Aluminium
12	Stator	Eisen/Kupfer
13	Motorgehäuse	Gusseisen
14	Halterung unteres Wälzlager	Gusseisen
15	Unteres Wälzlager	Stahl
16	Gleitringdichtung	Gummi/Metall/Siliziumkarbid
17	Ölverschluss G05-G06-G07-G08: 1/8” NPT	Stahl
	G10-M08: G3/8” DIN 906	Stahl
18	Zwischenhalterung	Gusseisen
19	Pumpenplatte	Gusseisen
20	Buchse	Bronze
21	Pumpengehäuse	Gusseisen
22	Laufrad	Gusseisen
23	Sperrschraube Laufrad	Stahl
24	Saugflansch	Gusseisen

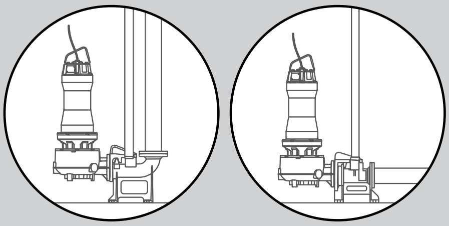
ES

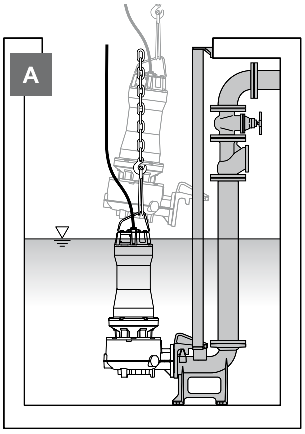
	Descripción	Material
1	Puño	Acero
2	Cable	Goma/cobre
3	Prensacable	Hierro fundido/acero
4	Tapón 1/8” NPT	Acero
5	Conexión de tierra	Acero
6	Tapa del motor	Hierro fundido
7	Sonda	Acero
8	Placa de bornes	Plástico/metal
9	Soporte de cojinete superior	Hierro fundido
10	Cojinete superior	Acero
11	Eje con rotor	Acero/hierro/aluminio
12	Estator	Hierro/cobre
13	Carcasa del motor	Hierro fundido
14	Soporte de cojinete inferior	Hierro fundido
15	Cojinete inferior	Acero
16	Cierre mecánico	Goma/metal/SiC
17	Tapón de aceite G05-G06-G07-G08: 1/8” NPT	Acero
	G10-M08: G3/8” DIN 906	Acero
18	Soporte intermedio	Hierro fundido
19	Plato de la bomba	Hierro fundido
20	Casquillo	Bronce
21	Cuerpo de la bomba	Hierro fundido
22	Turbina	Hierro fundido
23	Tornillo de bloqueo de turbina	Acero
24	Brida de aspiración	Hierro fundido

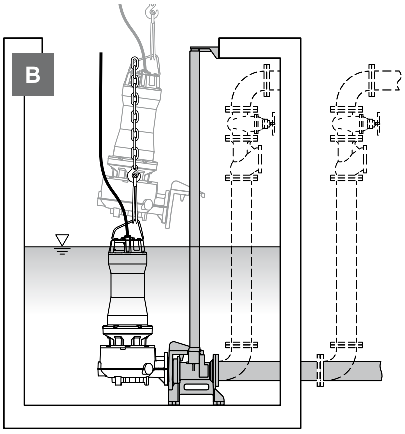
RU

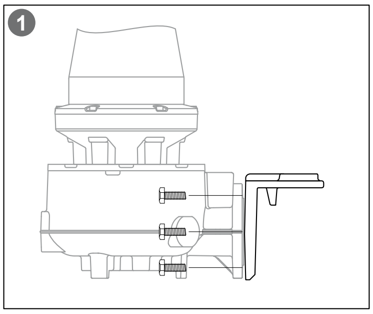
	Описание	Материал
1	Ручка	Сталь
2	Кабель	Резина/Медь
3	Кабельная муфта	Чугун/сталь
4	Пробка 1/8” NPT	Сталь
5	Клемма заземления	Сталь
6	Крышка двигателя	Чугун
7	Датчик	Сталь
8	Клеммная колодка	Пластмасса/металл
9	Опора верхнего подшипника	Чугун
10	Верхний подшипник	Сталь
11	Вал с ротором	Сталь/Железо/Алюминий
12	Статор	Железо/Медь
13	Корпус двигателя	Чугун
14	Опоры нижнего подшипника	Чугун
15	Нижний подшипник	Сталь
16	Сальник	Резина/металл/карборунд
17	Масляная пробка G05-G06-G07-G08: 1/8” NPT	Сталь
	G10-M08: G3/8” DIN 906	Сталь
18	Промежуточная опора	Чугун
19	Крышка насоса	Чугун
20	Втулка	Бронза
21	Корпус насоса	Чугун
22	Крыльчатка	Чугун
23	Блокировочный винт крыльчатки	Сталь
24	Всасывающий фланец	Чугун

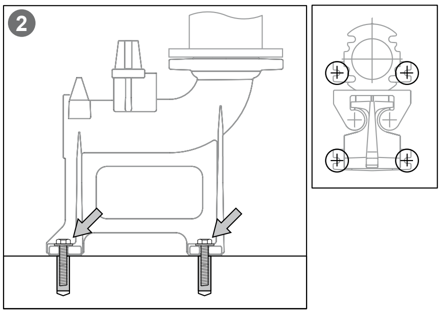
IT	**APPENDICE 1: Installazione con dispositivo di accoppiamento da fondo DAC**
EN	**APPENDIX 1: Installation with DAC coupling device**
FR	**ANNEXE 1: Installation avec dispositif d’accouplement au fond (DAC)**
DE	**ANHANG 1: Installation mit bodenbefestigtem Kupplungsfuß DAC**
ES	**APÉNDICE 1: Instalación con dispositivo de acoplamiento de fondo DAC**
RU	**ПРИЛОЖЕНИЕ 1: Установка с донным соединительным устройством DAC**

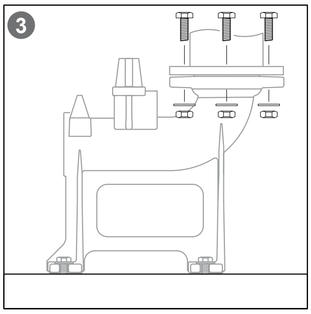


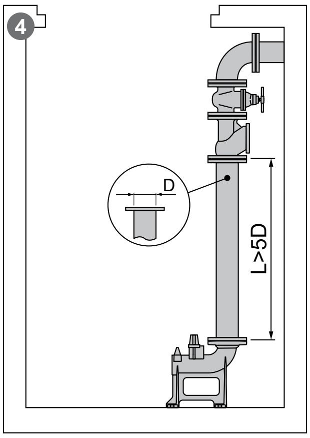


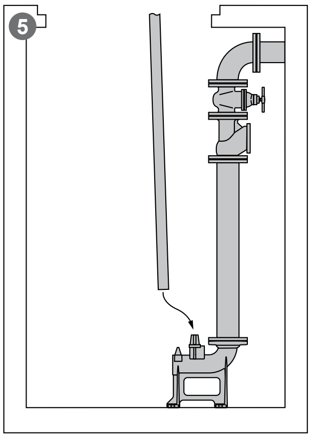


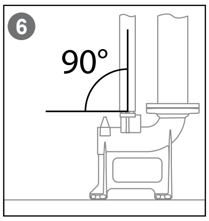


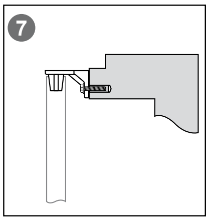


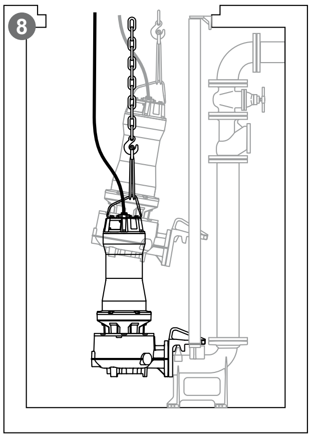












APPENDICE 2: Installazione mobile

IT

APPENDIX 2: Mobile installation

EN

ANNEXE 2: Installation mobile

FR

ANHANG 2: Mobile Installation

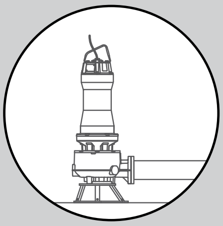
DE

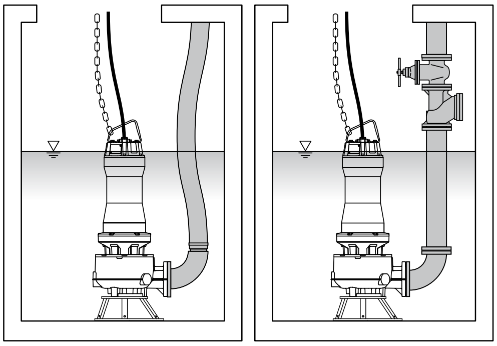
APÉNDICE 2: Instalación móvil

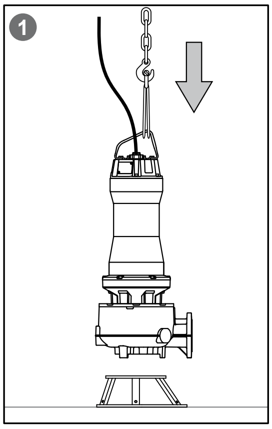
ES

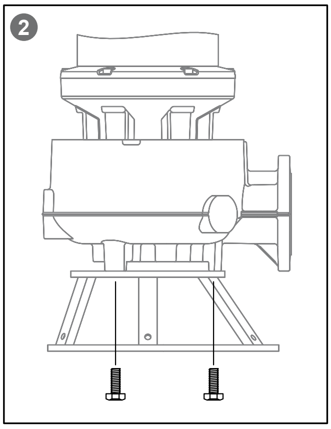
ПРИЛОЖЕНИЕ 2: Нестационарная установка

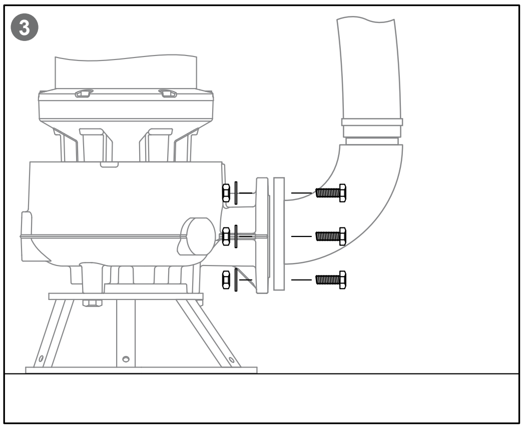
RU

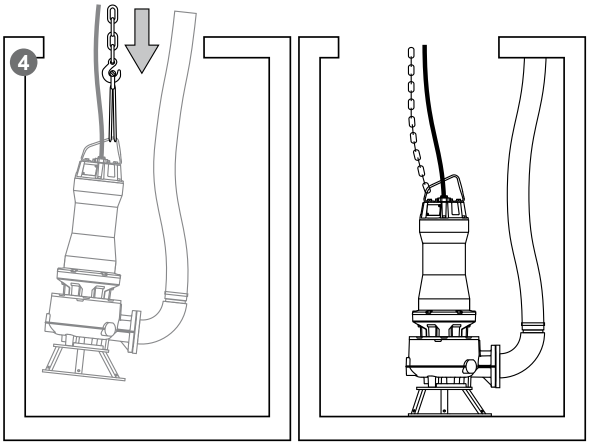


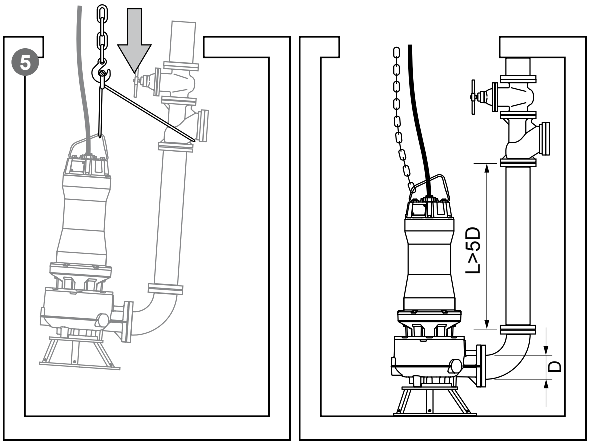




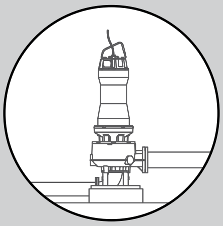


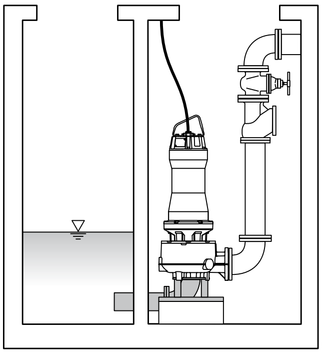


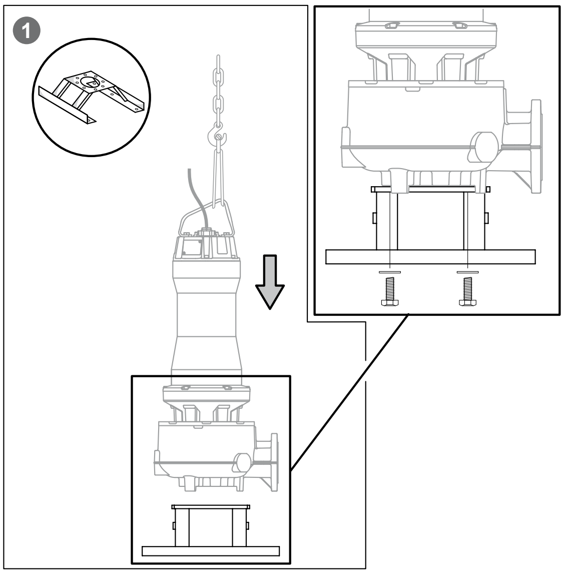


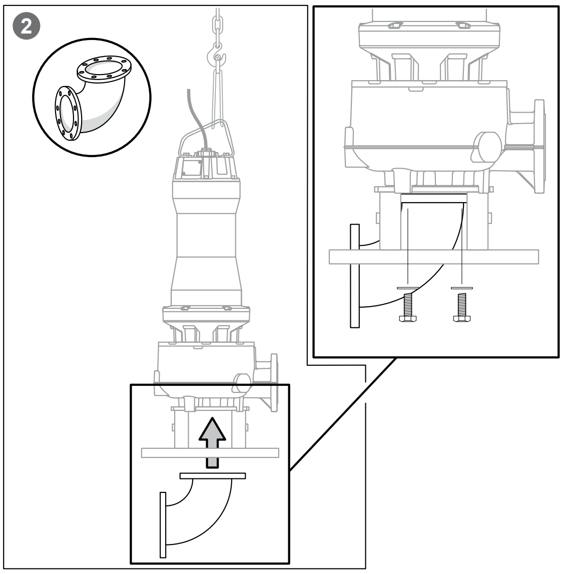


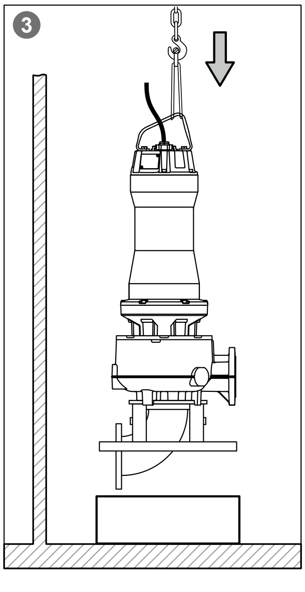
IT APPENDICE 3: Installazione verticale in camera a secco
EN APPENDIX 3: Vertical installation in dry chamber
FR ANNEXE 3 : Installation verticale en fosses sèches
DE ANHANG 3: Vertikale Installation im Trockenschacht
ES APÉNDICE 3: Instalación vertical en cámara en seco
RU ПРИЛОЖЕНИЕ 3: Вертикальная установка в сухой камере

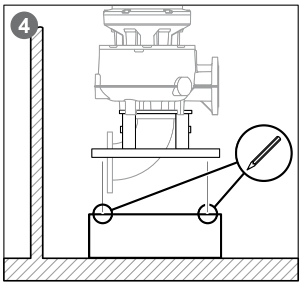


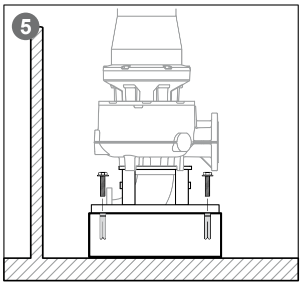


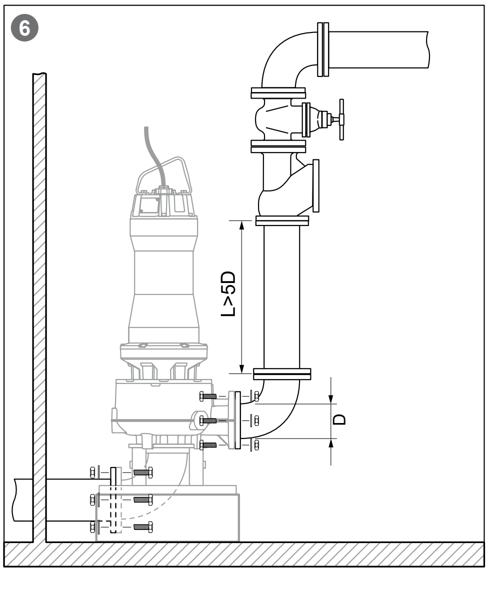




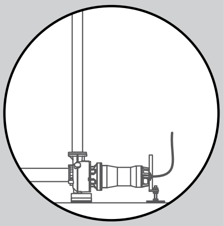








IT	**APPENDICE 4:** Installazione orizzontale in camera a secco
EN	**APPENDIX 4:** Horizontal installation in dry chamber
FR	**ANNEXE 4 :** Installation horizontale en fosses sèches
DE	**ANHANG 4:** Horizontale Installation im Trockenschacht
ES	**APÉNDICE 4:** Instalación horizontal en cámara en seco
RU	**ПРИЛОЖЕНИЕ 4:** Горизонтальная установка в сухой камере



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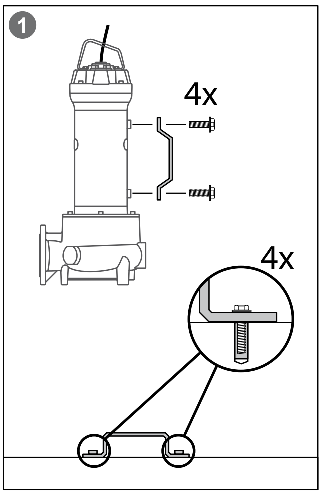

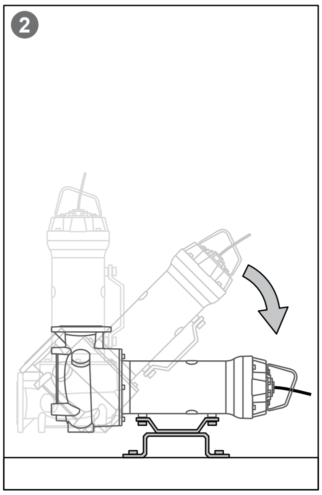

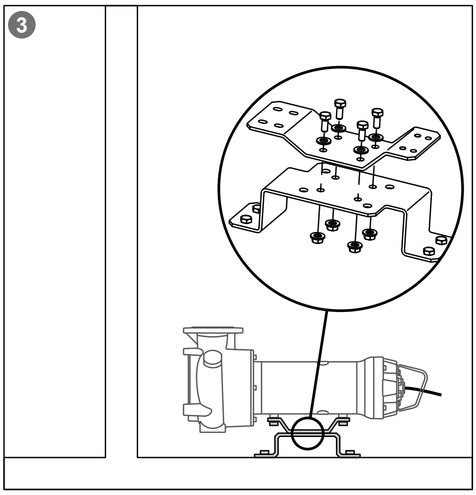

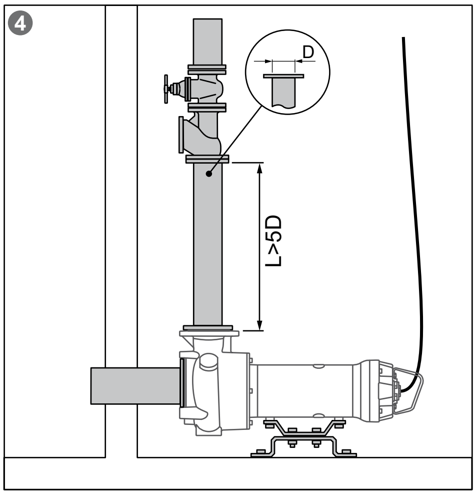

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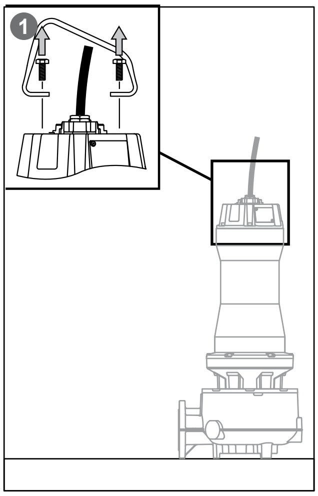

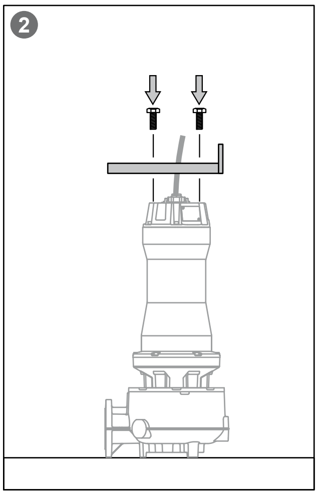

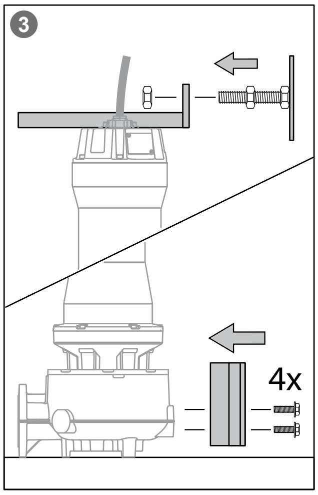

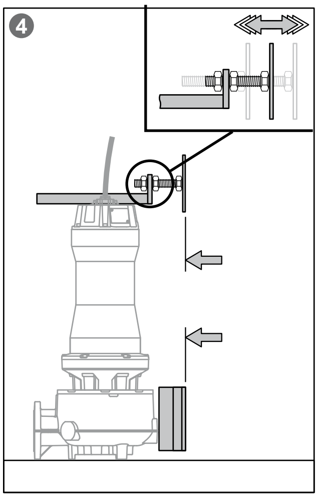

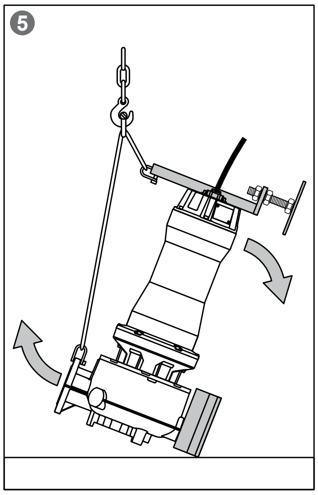

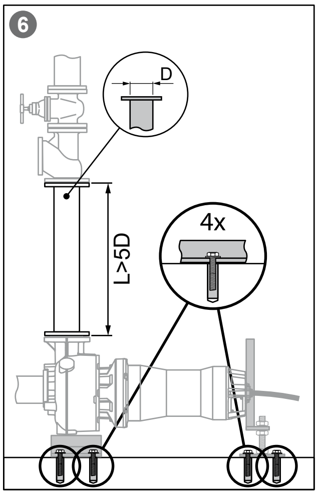

ATTACHMENT 02

Oil Skimmer model S100

Serial N.1076

FRIESS GmbH

Böttgerstraße 2

D-40789 Monheim

Maintenance Manual

FRIESS GmbH

Böttgerstraße 2 · 40789 Monheim · Telefon (0 21 73) 5 20 11 + 5 20 12 · Fax (0 21 73) 3 33 74
Internet: www.friess.info · E-Mail: post@friess.info

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FRIESS GmbH - Böttgerstraße 2 - D-40789 Monheim am Rhein

Declaration of conformity
According to EC-Machinery Directive 2006/42/EG

FRIESS GmbH declares that the

Product:	Oil skimmer
Type:	S100
Year of manufacturing:	2022
Serial-No:	1076

complies with the requirements of the European directives.

The manufacturer herewith declares conformity of above mentioned oil skimmer with following standards:

Machinery Directive: 2006/42/EG

The oil skimmer is a machine to remove floating oil and fat from water surfaces. The declaration of conformity is only valid if the oil collecting pan is used. If the oil collecting pan is not used, the conformity is unvalid unless an appropriate protection against touching the drive wheel is installed.

This declaration is not valid if the oil skimmer is used for other purposes than designed or if the construction is changed and not confirmed in writing by manufacturer.

Applied harmonized standards:

EN ISO 12100	Safety of machinery
EN 60204-1	Safety of machinery

This declaration certifies conformance with the above mentioned directives. Affirmation of attributes in a legal sence is not included. Security declarations given in the product documentation have to be considered.

Oliver Benneck / Executive director

Monheim, 11.11.2022

Böttgerstraße 2 · 40789 Monheim · Telefon (0 21 73) 5 20 11 + 5 20 12 · Fax (0 21 73) 3 33 74
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1. IMPORTANT SAFETY INFORMATION AND SAFETY INSTRUCTIONS

1.1 Range of application

Do not use the oil skimmer model S 100 for other purpose than designed. The oil skimmer model S 100 is designed to pick up floating oil and fat from liquid surface. The oil skimmer is not designed for other applications.
The manufacturer is not responsible for any damage because of using the oil skimmer for other purpose than designed. The manufacturer is not responsible for any damage because of mechanical, electrical or other changes made by others than the manufacturer.
Please follow the start-up, operating and maintenance instruction of this manual. Please pay attention to the local safety regulations and to the general and special safety regulations in your factory.
Please pay attention to the signs mounted at the oil skimmer model S 100.

1.2 Safety information and safety instructions

1.2.1 Fundamental safety information

Please pay attention to the local safety precautions and to any other general safety precautions and health regulations. Please pay attention to the safety precautions for electric components. If you do not watch this regulations the manufacturer will not be responsible for any damage. This manual is part of the FRIESS oil skimmer model S 100. In case you resell the oil skimmer you have to deliver the oil skimmer with this manual. For safe operation of this oil skimmer the oil skimmer has to be operated and serviced or fixed by trained personnel only. Trained personnel are persons, which have knowledge about necessary technical standards, technical regulations and safety information and which are able to handle technical products and recognize possible dangerous situations and are able to avoid these dangerous situations.

The owner of this oil skimmer has to take care, that the persons who are responsible for operating, maintenance and service and repairing of this oil skimmer have read and understood this manual and pay attention to all points of this manual. This is necessary to avoid dangerous situations

- for the user and other persons

-for safe operation of the oil skimmer model S 100

and

-to avoid damage at the environment caused by wrong operation.

Before start working please lay down all competences. Everybody has to follow these competences.

Removal, shut-down or switching-off of covers, protection-switches or other safety equipment may cause **severe** injuries or death or material damage. For this reason the manufacturer prohibits to remove or shut off safety devices. The manufacturer prohibits to work at the oil skimmer model S 100 while the oil skimmer is connected with electric power. After maintenance or other work all safety devices have to be installed correctly.

The manufacturer warrants for the oil skimmer model S 100 according to the general sales terms. The manufacturer warrants not for the oil skimmer model S 100 in case of damage caused by wrong operation, repairing of maintenance done by not trained personnel, using additional equipment or spare parts which are not specified for the oil skimmer model S 100 by manufacturer, changes or conversions without confirmation by manufacturer in writing.

Any failure has to be reported to the responsible person as soon as possible. In case of malfunction the oil skimmer model S 100 has to be marked as *defect*. Before restart all defects have to be fixed, otherwise there is no warranty by the manufacturer.

1.2.2 General safety instructions

This safety devices may not be complete. Please contact manufacturer in case of questions or problems. The oil skimmer model S 100 is manufactured according to the latest technology and is safe in operation. You may use the oil skimmer model S 100 only under the conditions and circumstances which are confirmed by manufacturer. Any change or rebuilding of the oil skimmer is not allowed. Please contact manufacturer before changing the design of the oil skimmer.

1.2.3 Special safety instructions

The oil skimmer model S 100 must not be used without the safety hood and the oil collecting pan. In case you do not want to use the original hood or the original oil collecting pan you have to install a safety device with the same effect. During operation of the oil skimmer model S 100 do not remove the safety hood in order to avoid accidents. During repairing, servicing, maintenance or cleaning you have to switch-off the oil skimmer before working at the oil skimmer. Make sure that it is not possible to switch-on the oil skimmer during working at the oil skimmer. If using the oil skimmer with an additional oil collecting tank you have to install a safety switch at the oil collecting tank in order to avoid environment damage caused by overfilling the tank with oil.

Do not touch the oil collector tube during operation of the oil skimmer.

Make sure that it is not possible to touch the oil collector tube during operation. This can be done by additional safety guards or rails.

2. GENERAL DESCRIPTION

The Oil Skimmer model S 100 is designed to remove floating oil and fat from water, emulsions, washing water or waste water. The floating oil and fat sticks to the outside of the free floating flexible oil collector tube. The oily oil collector tube is drawn into the oil skimmer. Ceramic scrapers remove the oil from the surface of the oil collector tube. The clean oil collector tube returns to the water surface and picks up new oil or fat. The oil, that is removed from the oil collector tube floats into the oil collector pan of the oil skimmer and from there into a collecting tank, which has to be furnished by the customer. The **FRIESS** oil skimmer model S 100 is designed for tanks with a bigger surface. The minimum surface of the tank has to be 1300 x 1300 mm. The skimmer may be mounted up to 20 m above water level. The oil skimmer has to be mounted above the maximum liquid level.

2.1 Description of parts

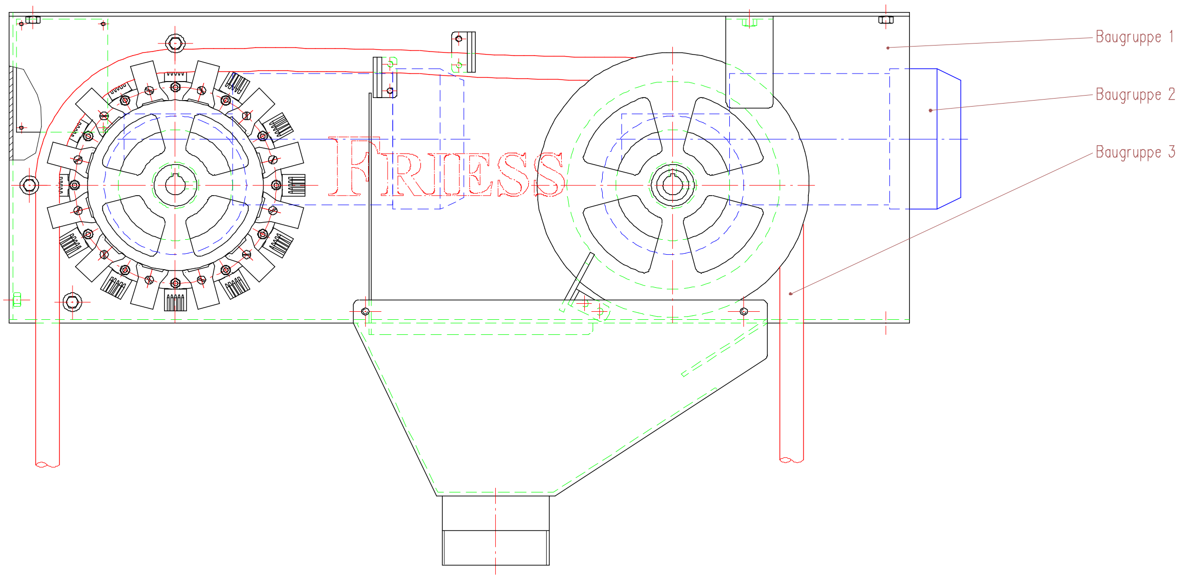
The oil skimmer model S 100 is made of three structural components:

structural component 1: oil skimmer model S 100 with oil collecting pan (100 100 002)
or without oil collecting pan (100 100 001)

structural component 2: two gear motor SN9f
The gear motors are special designed for each application and may vary from one oil skimmer to the next. Only the data plate on the gear motor shows the correct technical data.

structural component 3: oil collector tube
The different oil collector tubes are available:

Type St (101 000 003) for bath temperature by -20°C to +40°C, pH-value 0-14
Type B (101 000 002) for bath temperature by +10°C to +75°C, pH-value 4-14
Type Super (101 000 001) for bath temperature by +30°C to +95°C, pH-value 0-14



2.2 Description of process

The oil skimmer model S 100 has to be mounted above the maximum liquid level. The oil collector tube must not touch walls or other components when running into the oil skimmer. If the oil collector tube touches other parts it will lose oil and the efficiency will be lower. The oil collector tube, that leaves the oil skimmer, can be guided in order to pass through a small opening in the cover of the tank. Depending on the amount of sludge in the oil the oil skimmer has to be cleaned from time to time. Depending on dirt or sludge in the oil and depending on the viscosity of the oil or fat, the drain must be big enough and steep enough to avoid blocking. The drain must have a diameter of at least 3“ and incline of at least 15°. If the oil contains a lot of sludge or when using the oil skimmer with vegetable oil or fat we suggest to use an open chute which has to be cleaned from time to time.

3. START UP

3.1 Preparation

Before commissioning check whether the oil collector tube is floating on the bath surface in a semi circular or oval shape. Floating length of the oil collector tube can be up to 3 – 4 m. If you want to service a very big surface of a bigger basin the length of the oil collector tube, floating on the water, maybe longer. In this case you have to mount a guide for the oil collector tube.
Please check after the start of the gear motors the turning sense of the drives. Both drives have to run in the same direction. When looking on the drive wheel the oil collector tube has to run not clockwise. Both gears of the gear motors are filled with lubricant. The lubricant has not to be changed.
Please mount the breather screws at the highest possible positions.

In case of longer storing of the oil collector tube we suggest to hang the collector tube for at least two days in not twisted form.

3.2 Start up and operating

After starting the oil skimmer model S 100 make sure, that the oil collector runs properly without being turned and make sure, that the oil collector tube does not lose oil.
Please check the outlet of the oil collector pan in order to avoid blocking by dirt or fat.

4. CLEANING AND MAINTENANCE

For trouble free operation of the oil skimmer following maintenance is necessary:

weekly

- Please check the operation of the oil collector tube
- Please check the drain.

every six months

- Remove the safety hood and clean the oil skimmer.
- Check the scrapers, the oil collector and the ceramic fingers whether they are worn out or cracked.

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ATTENTION: Before servicing the oil skimmer watch the safety instructions in this manual !!!

Changing the oil collector tube

ATTENTION: Do not cut the oil collector tube !!!
It is possible to change the oil collector tube as one piece.

Switch off the oil skimmer and protect against restart. Remove the safety hood. Remove the tube guide and both ceramic cylinders according to attached drawing. Change the oil collector tube. Mount both ceramic cylinders and the tube guide. The ceramic cylinder (A) has to be mounted as far away as possible from the drive wheel; the ceramic cylinder (B) has to be mounted as near as possible towards the drive wheel. See attached drawing.
Mount the safety hood. Start the unit and check the operation of the oil collector tube.

CAUTION:

The service life of the oil collector tube depends very strongly on the application. In general the following can be applied: The higher the temperature (more than 40°C), the higher the load on the oil collector tube and the shorter the service life. For certain applications it should be tested whether the oil collector tube and the medium are compatible. The minimum service life of the oil collector tube is approx. 3 months. For applications involving an oil/water mixture at room temperature, a service life of one or two years can be expected. We recommend unrolling the oil collector tube before commissioning and storing it in the unrolled state, hung up for 2 days.

5. MALFUNCTION

The oil skimmer removes no oil
-Check whether there is oil on the water surface

-Check whether the floating oil sticks to the oil collector tube and whether the tube brings the oil to the oil skimmer

-If the oil is not remove from the oil collector tube check and replace the scrapers and the oil collector tube

-Check whether the drain is blocked and clean if necessary

The amount of water in the skimmed oil is to high
-Check whether there is enough oil on the water surface (>0,2 mm). Reduce the operating time of the skimmer by a timer.

-Use the **FRIESS** decanter. With the decanter you can eliminate water that is collected by the oil skimmer

After starting the drive wheel or the pulley wheel does not turn
-Switch of the oil skimmer and check by turning of the fan at the motor, whether the motor shaft is blocked ore not

-Start the oil skimmer and check whether the motor shaft turns, if the motor turns and the drive wheel or the pulley wheel not, the gear is damaged and has to be replaced

Drive wheel and pulley wheel turn, but the oil collector tube does not move
-Check whether the motors turn the right way

-Check the oil collector tube whether it`s worn out

-Check the ceramic fingers of the drive wheel, whether they are worn out

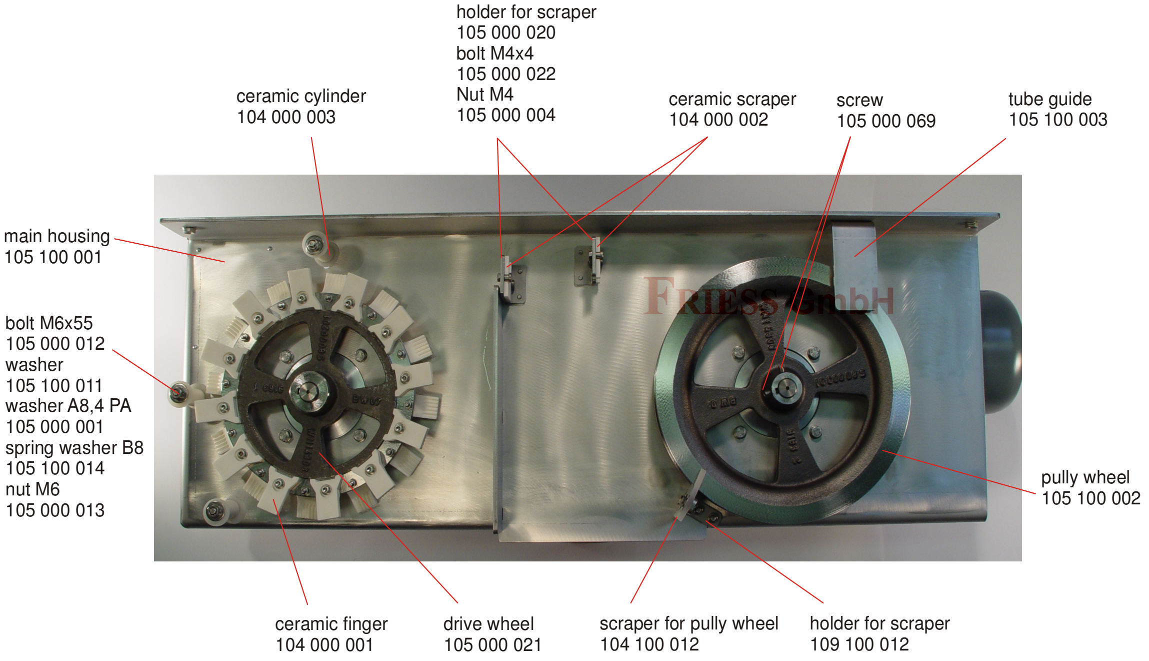
-Check the correct place of the ceramic cylinder. See attached drawing.
The ceramic cylinder (A) has to be mounted as far away as possible from the drive wheel; the ceramic cylinder (B) has to be mounted as near as possible towards the drive wheel.

6. TECHNICAL DOCUMENTATION

6.1 Parts list

6.1.1 Spare parts

Pos.	no.		Drawing no.	Item
5	24	Pc	104000001	Ceramic finger for drive wheel
6	2	Pc	104000002	Scraper for oil collector tube
9	2	Pc	104100012	Scraper for pulley wheel
		Meter		Oil collector tube type B

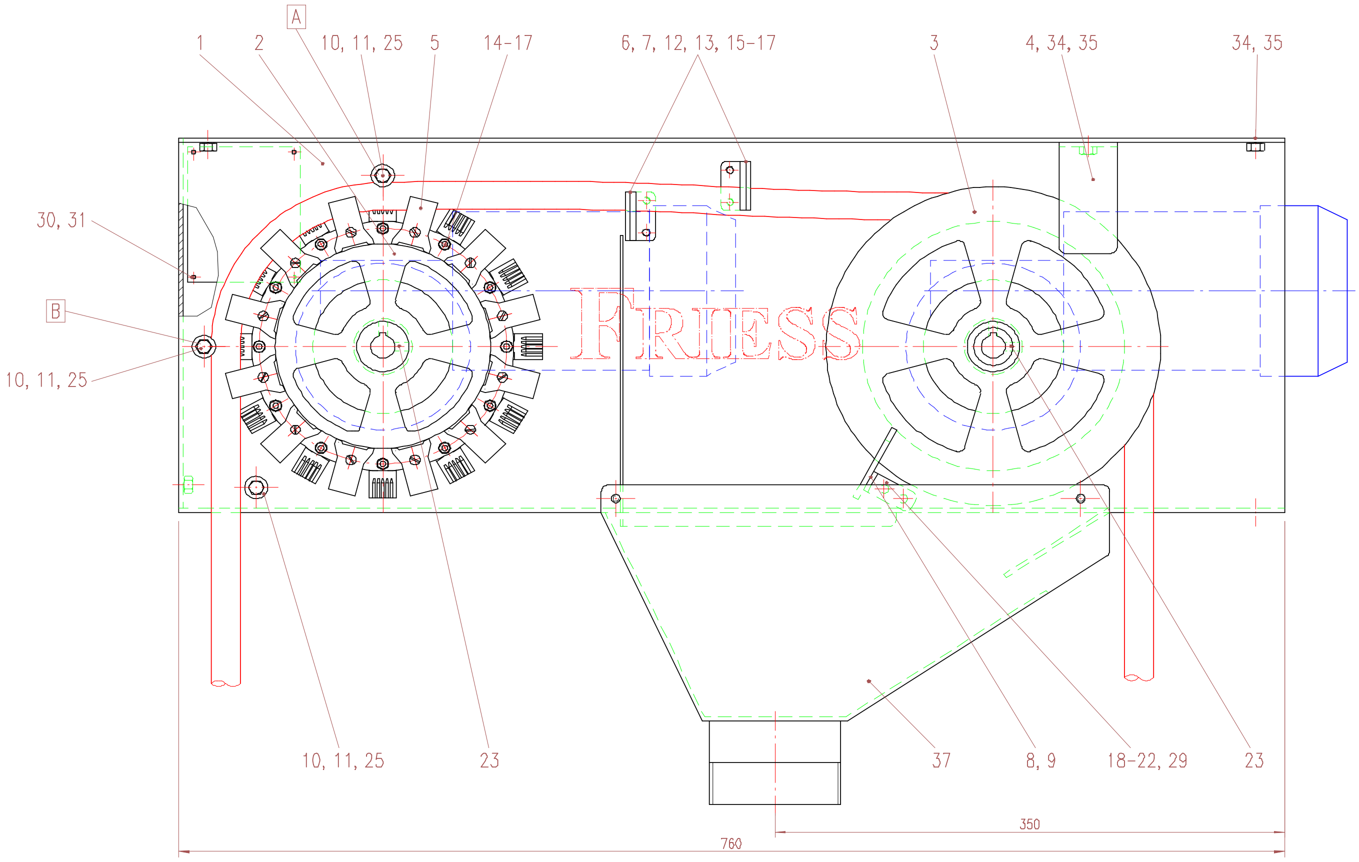

holder for scraper
105 000 020
bolt M4x4
105 000 022
Nut M4
105 000 004
ceramic cylinder
104 000 003
ceramic scraper
104 000 002
screw
105 000 069
tube guide
105 100 003
main housing
105 100 001
FRIESS GmbH
bolt M6x55
105 000 012
washer
105 100 011
washer A8,4 PA
105 000 001
spring washer B8
105 100 014
nut M6
105 000 013
pully wheel
105 100 002
ceramic finger
104 000 001
drive wheel
105 000 021
scraper for pully wheel
104 100 012
holder for scraper
109 100 012

6.1.2 Parts list oil skimmer model S 100

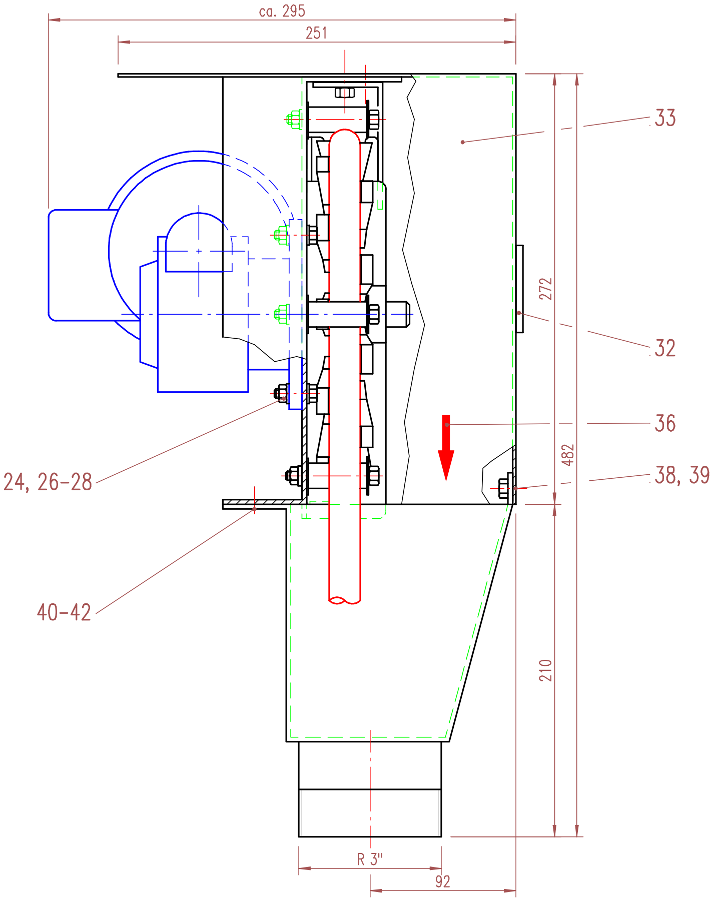
Pos.	No.		Drawing no.	Item
1	1	Pc	105100001	Main housing
2	1	Pc	105000021	Drive wheel S100
3	1	Pc	105100002	Pulley S 100
4	1	Pc	105100003	Tube guide S 100
5	24	Pc	104000001	Ceramic finger 2H/3H/5H/6V/W40/S 100
6	2	Pc	104000002	Ceramic scraper W40 / S 100
7	2	Pc	105000020	Holder for scraper W40 / S 100
8	0,01	x100	104100012	Scraper for pulley wheel S 100
9	1	Pc	105100004	Holder for pulley wheel scraper S 100,
10	3	Pc	104000003	Ceramic cylinder 1U / W40 / S 100
11	0,06	x100	105000001	Washer DIN9021 A8,4 PA
12	0,04	x100	105000006	Screw DIN933 M4x10 V2A
13	0,04	x100	105000022	Screw DIN923 M4x4 V2A
14	0,24	x100	105000003	Screw DIN84 M4x20 V2A
15	0,28	x100	105000004	Nut DIN934 M4 V2A
16	0,28	x100	105000007	Washer DIN125 A4,3 V2A
17	0,28	x100	105000005	Lock washer DIN127 A4 V2A
18	0,02	x100	105000028	Screw DIN933 M5x10 V2A
19	0,02	x100	105100007	Screw DIN933 M5x16 V2A
20	0,02	x100	105000009	Nut DIN934 M5 V2A
21	0,02	x100	105100008	Washer DIN125 A5,3 V2A
22	0,02	x100	105000010	Lock washer DIN127 A5 V2A
23	0,04	x100	105000024	Screw DIN438 M6x12 V2A
24	0,09	x100	105000026	Screw DIN933 M6x20 V2A
25	0,03	x100	105000012	Screw DIN931 M6x55 V2A
26	0,11	x100	105000013	Nut DIN934 M6 V2A
27	0,08	x100	105000027	Washer DIN125 A6,4 V2A
28	0,11	x100	105000014	Lock washer DIN127 A6 V2A
29	0,02	x100	105000029	Washer DIN9021 A5,3 V2A
30	1	Pc	105000017	Data plate Friess
31	0,04	x100	105000018	Tubular rivet DIN 7337 3x8 Al
32	1	Pc	105100013	Name plate Friess
33	1	Pc	105100005	Safety hood S 100
34	0,04	x100	105000025	Screw DIN933 M6x10 V2A
35	0,04	x100	105100011	Washer DIN9021 A6,4 V2A
36	1	Pc	106000036	Arrow red
37	1	Pc	102100001	Oil collector pan S 100
38	0,02	x100	105000025	Screw DIN933 M6x10 V2A
39	0,02	x100	105100011	Washer DIN9021 A6,4 V2A
40	0,02	x100	105100009	Screw DIN933 M8x20 V2A
41	0,02	x100	105100014	Lock washer DIN127 B8 V2A
42	0,02	x100	105100010	Washer DIN9021 A8,4 V2A

6.2 Drawing

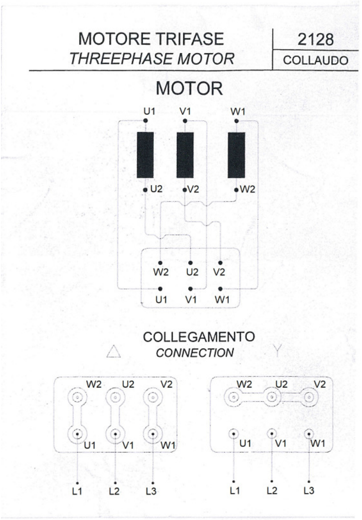
6.2.1 Front View

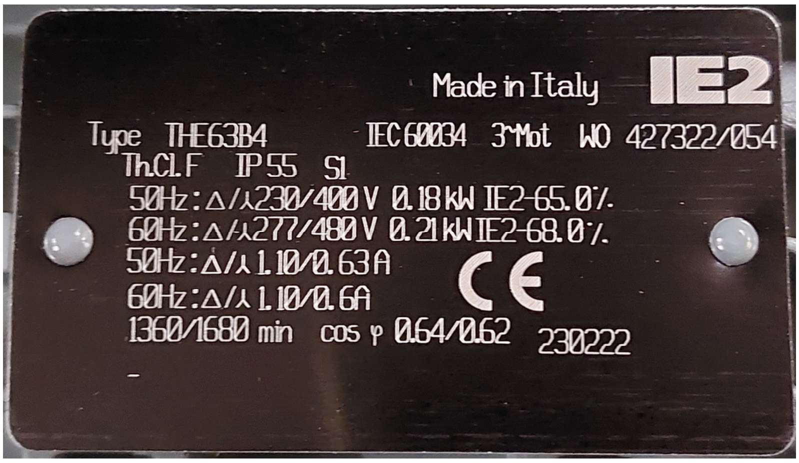

A
1
2
10, 11, 25
5
14-17
6, 7, 12, 13, 15-17
3
4, 34, 35
34, 35
30, 31
B
10, 11, 25
FRIESS
10, 11, 25
23
37
8, 9
18-22, 29
23
350
760

6.2.2 Side View


ca. 295
251
33
272
32
36
482
38, 39
24, 26-28
40-42
210
R 3"
92

6.3 Wiring diagram and motor data plate





6.4 Operating and safety instructions worm gear motors

0. Foreword
A geared motor proper is not subject to the Machinery Directive. Through appropriate installation and/or assembly in an overall system it becomes a component of the machine or plant under construction, which must comply with the relevant standards and directives. The manufacturer of the machine bears the sole responsibility for compliance with these standards.

1. Safety Instructions
A machine may not be taken into use until it has been ascertained that it meets the protection and safety requirements of Machinery Directive 89/392/EEC and its amending Directives 91/368/EEC or 93/44/EEC. The basic prerequisite for correct installation and connection is knowledge of, and compliance with, the operating and safety instructions, and the regulations relating to industrial safety and accident prevention. Only qualified persons may be charged with work on geared motors. Faults susceptible to prejudice safety must be rectified immediately by previously appointed staff.

ATTENTION – HIGH VOLTAGE !!!
Geared motors are devices for use in industrial machinery and plant. In operation, these devices can have dangerous live, non-insulated parts, or perhaps moving or rotating parts. Hence, for example, unauthorised removal of the required casing, or improper use, incorrect operation or poor maintenance, could lead to severe bodily harm or damage to machinery.
Persons responsible for the safety of the machine or plant must therefore ensure that
- only qualified persons are charged with working on the machines or plant.
- such persons always have access to the current operating instructions and other product documentation applicable to the work in hand, and that they are charges with consistent compliance with these documents
- unqualified persons are prohibited from working on or near the machines or equipment.

Qualified Personnel are persons who by reason of their training, experience, instruction and their knowledge of the relevant standards, regulations, accident prevention rules and working conditions have been authorized by the person responsible for the safety of the machine or plant to perform the appropriate activities required, and thereby are able to recognise and prevent potentially dangerous situations (For the definition of skilled workers see VDE 0105 or IEC 364, which also regulate the prohibition of the employment of unqualified persons). A knowledge of first aid and the local rescue organisation must also be included.

It is assumed that the basic planning of the machine or plant and all operations relating to its transportation, assembly, installation, commissioning, maintenance and repair will be performed by qualified personnel or controlled by responsible skilled hands. In this respect, special attention should be paid to:
- technical data, and information on permissible use which are included in the catalogue, the documents relating to the order and on the data plate,
- the general regulations applicable to erection and safety,
- the local regulations and requirements specific to the machine or plant
- the proper employment of tools, lifting and transport devices,
- the use of personal protective equipment,
- assembly conditions, to ensure the necessary protection for operators during use, and to prevent personnel from approaching too closely for safety.

The present documentation would become too unwieldy if it contained all the detailed information relative to possible construction variants, and it cannot take into account every conceivable case involving erection, operation or maintenance. Consequently, it only contains the essential instructions necessary for qualified personnel operating geared motors in industrial areas of application. Should, in a special case where it is intended to use the machine or plant in non-industrial areas of application, more stringent requirements have to be met (e.g. to prevent children's fingers from touching the machine), these conditions must be assured during assembly by introducing additional safety measures for the machine or plant.

Changes from normal operation (increased power consumption, raised temperatures, vibrations, noises, etc. or indications from monitoring facilities) lead to the assumption that the machine is not functioning correctly. To prevent faults which, in their turn, might cause serious indirect or direct damage to persons or machinery, the responsible maintenance staff must be informed immediately.

IN CASE OF DOUBT; SWITCH OFF THE MACHINE INVOLVED AT ONCE !!!

2. Regulation Use
The geared motors are designed exclusively for installation in or for mating with a machine or plant in industrial use. Use for any other or extended purpose is non-regulation. The supplier will not be liable for any damage arising from this improper use.

3. Erection
The beds on which the gears and geared motors are to be erected must be adequately dimensioned and free from vibration. When mounting the geared motors care must be taken to ensure that these are immovably mounted, free from distortion, and on a level surface. Adequate ventilation for the motors must be assured. Should coupling elements be fitted onto the drive- or output-shaft blows to the shafts must be avoided since they could cause leakage or damage to the bearings. Prior to fitting, the shaft-end should be lightly greased to facilitate mounting. We recommend that a flexible coupling be employed in order to reduce shock on the gears or geared motor from the machine being driven.

4. Electrical Connection
The electrical connection of the motor may only be performed by personnel with the appropriate qualification and in compliance with the prescribed safety precautions and the local regulations governing electrical connections (see para.1 Safety Instructions). The motor must be connected in accordance with the circuit diagram in the terminal box. Care must be taken to ensure that the voltage of the power supply corresponds to that on the performance plate of the motor. Any additional devices installed, such as brakes, revolution counter generators, and secondary fans, must comply with the appropriate standards. The direction of rotation can be changed in three-phase motors by changing two phases, in alternating-current (a.c.) motors by re-clamping the bridges on the terminal boards, and in direct-current (d.c.) motors by changing the polarity of the armature voltage – all this may only be performed when the motor is at standstill !

5. Safety Precautions
The earth lead must without fail be connected to the marked earthing screw! To protect it against overloading every motor should be fitted with a trip switch. Heat-sensitive safety devices react to effective values, and the manufacturer will design them accordingly when ordered. Where a transformer is used, the voltage must be restricted to the level of the effective nominal voltage.

6. Maintenance
ATTENTION ! Before starting any maintenance operations the geared motor must be permanently disconnected from the mains.
a) Motor: It is recommended that, depending on the ambient dust arising, the dirt accumulation on the fan cowling of the motor and the motor and gears themselves should be cleaned off from time to time (heating). In the case of motors with carbon brushes, these should be checked at regular intervals. The life of the brushes depends on the mode and conditions of operation. The brushes must be renewed as and when this becomes necessary. Once the fan cowling, the holding band or the screw-caps have been removed the brushes are in most cases easily accessible.
b) Gears: On delivery, the geared motors are ready for use and filled with gear grease or oil. This ensures long-term lubrication for all drive parts and bearings. No complicated stripping, cleaning or grease change are required. Should, however, any additional greasing become necessary then synthetic and mineral lubricants must not be mixed.

7. Closing Remarks
Your attention is drawn to the fact that the contents of the operating and safety instructions and of the product documentation do not form part of any previous or existing agreement, undertaking or legal relationship, nor are they designed to alter such. All the obligations incumbent upon RUHRGETRIEBE are based on the contract of sale in each case, which also contains the complete and solely applicable regulations relating to the guarantee. The contractual provisions of the guarantee are neither extended nor restricted by the statements contained in these operating and safety instructions.

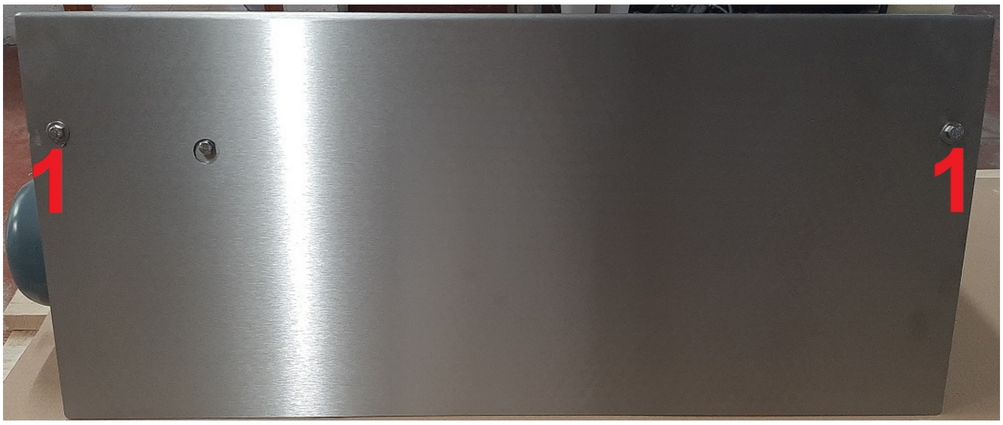
7. APPENDAGE

7.1 Lubrication informations

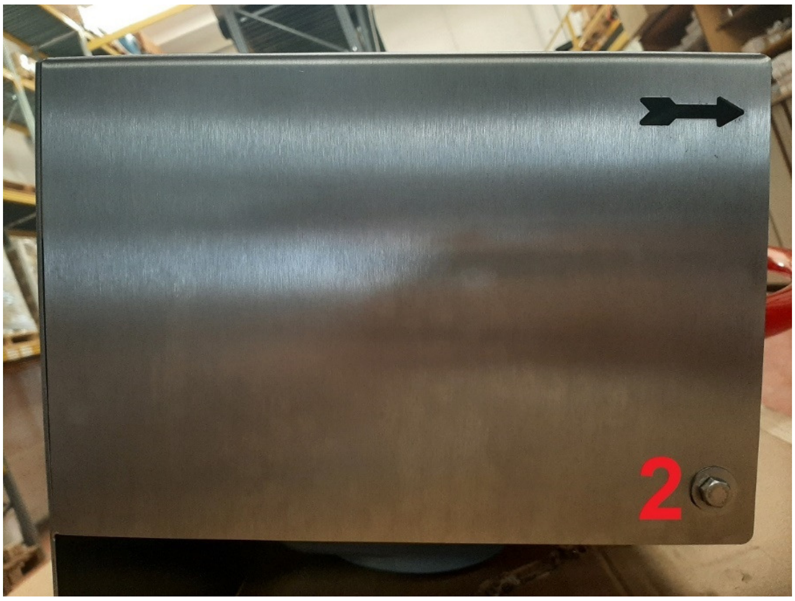
The gear motors are filled with lubrication. During the life time of the gear motors it is not necessary to change the lubrication.

8. OIL COLLECTOR TUBE MOUNTING INSTRUCTIONS

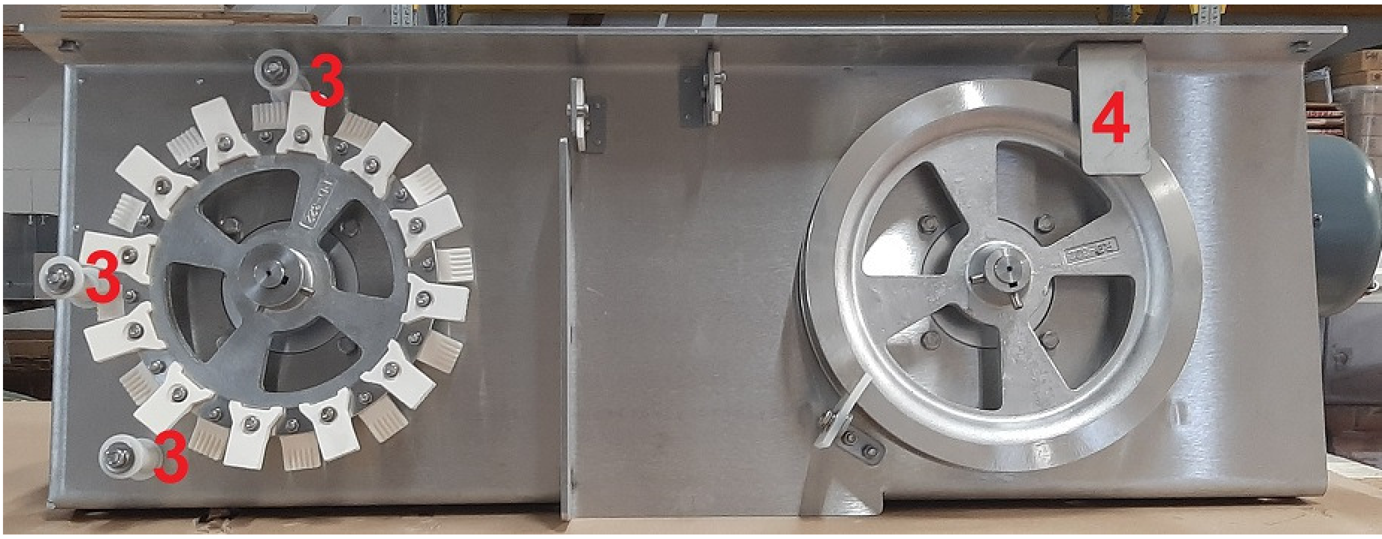
1) Remove the two side bolts on the front panel **(1)**



2) Remove the bolt on the side **(2)** and remove the front panel



3) Remove the ceramic cylinders **(3)** and the oil collector tube guide **(4)**



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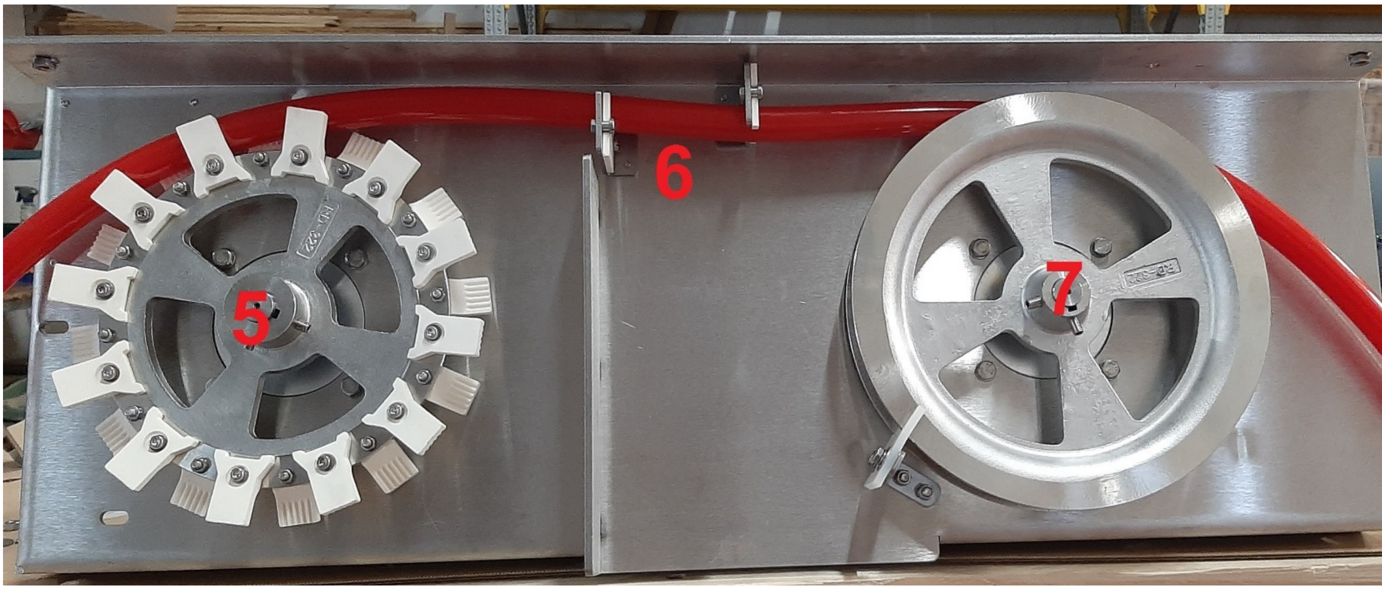
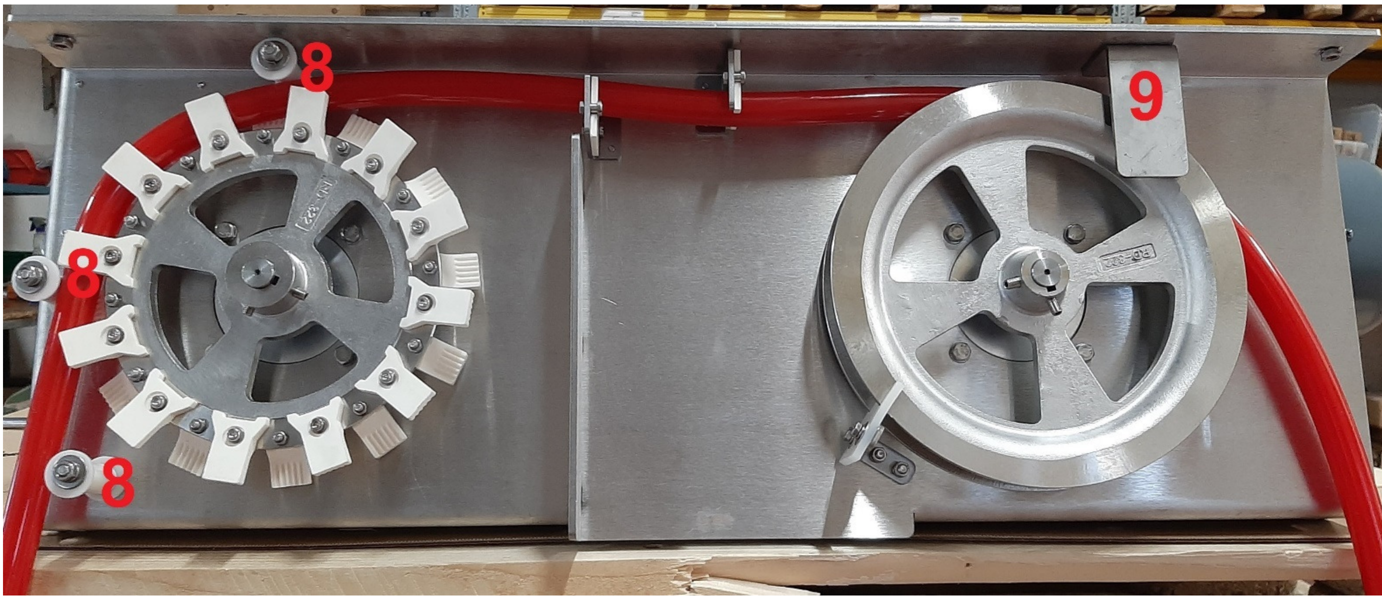
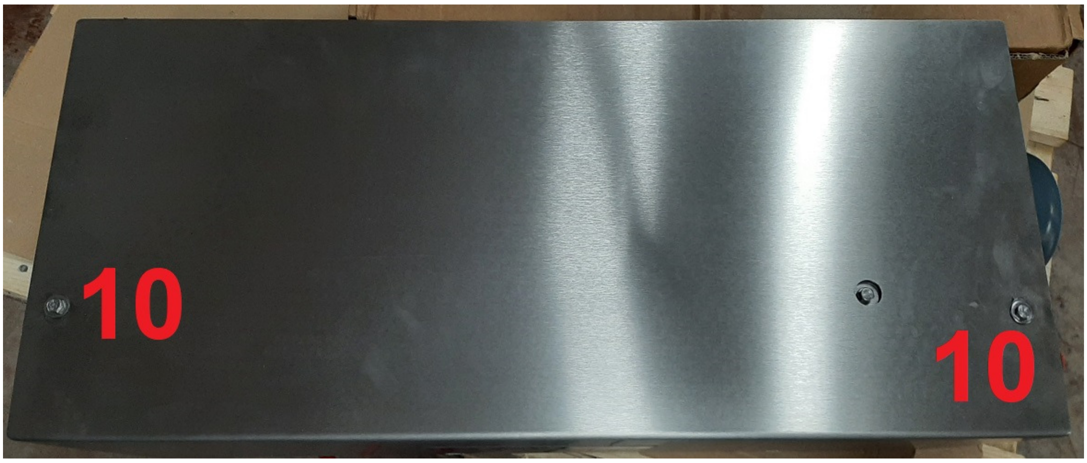
4) Take the ring-welded tube and lay it down between the ceramic teeth of the drive wheel **(5)**, through the two scrapers **(6)** and into the pulley wheel **(7)**



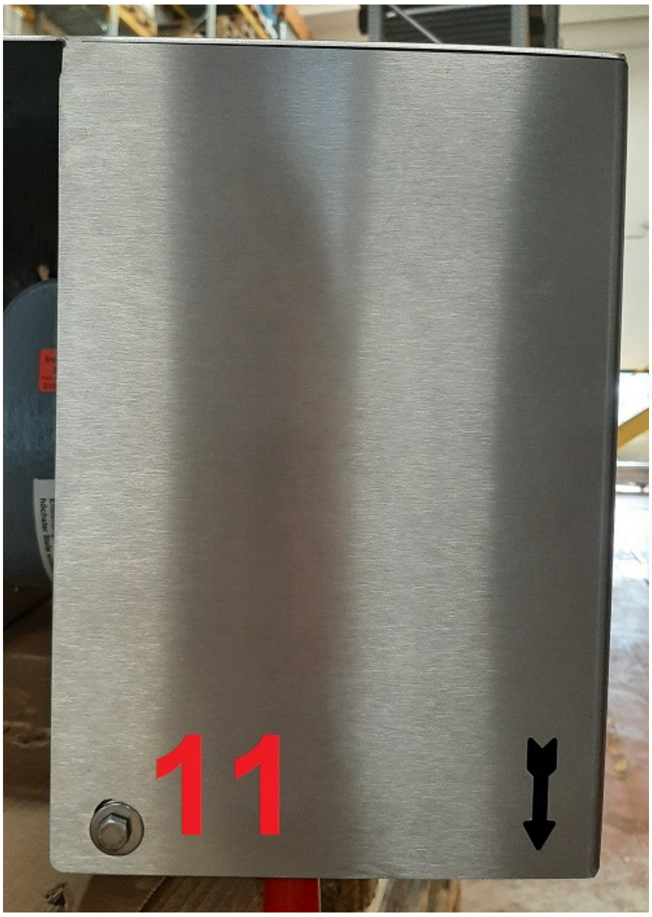
5) Reposition the ceramic cylinders **(8)** and the oil collector tube guide **(9)**. The oil collector tube must pass into the machinery as in the photo below:



6) Reposition the front panel and screw back the two side bolts **(10)**



7) Screw back the bolt on the side **(11)**



8) Now the machine is ready to be used.

ATTACHMENT 03

PLUNGER METERING PUMPS

INSTRUCTIONS MANUAL **EN**

HANDBUCH **DE**

MANUAL DE INSTALACION **ES**

MANUEL D’INSTALLATION **FR**

MANUALE D’INSTALLAZIONE **IT**

Operation, maintenance and installation manual

PLUNGER METERING PUMPS

Read the instructions carefully before installing and starting the equipment.

The infomation contained in this manual is subject to change without notice and does not represent a commitment.

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1.1 Applications
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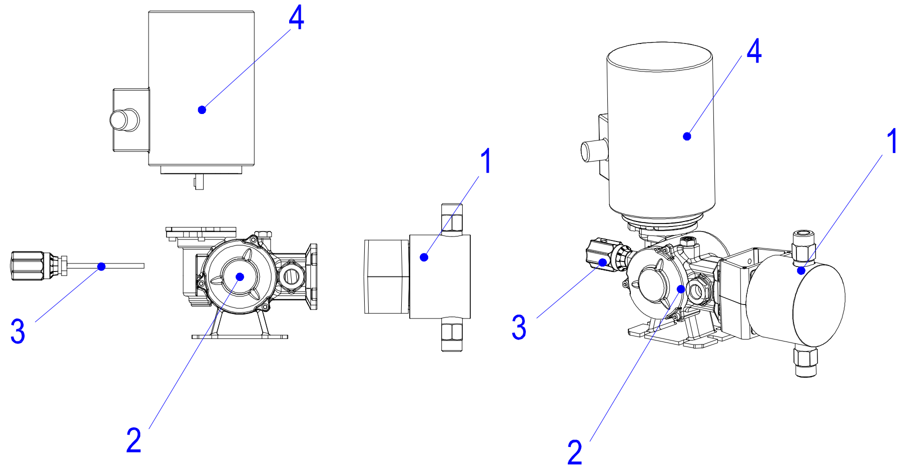
6. HANDLING AND STORAGE
6.1 Handling
6.2 Storage and preservation

Installation suggestions table

1. DESCRIPTION



1	Testata	Cabeza	Pump head	Tête	Pumpenkopf
2	Meccanismo	Mecanismo	Mechanism	Mecanisme	Triebwerk
3	Regolazione	Regulaciòn	Adjustment	Régulation	Hubeinstellung
4	Motore	Motor	Motor	Moteur	Motor

The metering pump is a reciprocating positive displacement pump; basic components are: the prime mover, the gearbox, the mechanism, the stroke length adjustment and the liquid end .

⇨ **The design of the metering pump fulfills Italian safety and accident prevention regulations.**

Safety instructions

WARNING
Exceeding the maximum allowed operating pressure must be prevented
(e.g. by using a pressure relief valve)

Before starting to work on the metering pump verify carefully the following:

- the drive is disconnected from the power source
- parts such as pumphead and piping are depressurized
- parts in contact with aggressive substances are washed before handling
- personnel protection is carried out according to local regulations

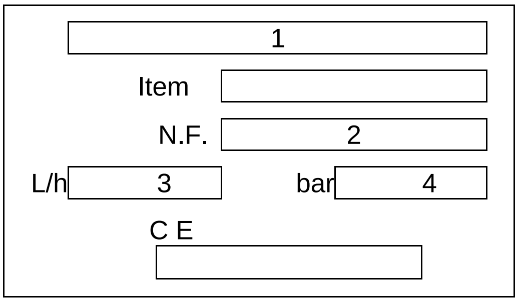
1.1 Applications

Metering pump is a process component capable to transfer defined volumes of liquid with high accuracy, moreover it is possible to vary the flow rate by acting on integral devices.
To obtain the bestperformances, select the pump considering the duty required and the conpatibility of the construction materials of the contact parts.

Before using a pump for a duty different from the original one, please contact our Technical Dept. for information.

1.2 Identification label

Standard Actual dimensions: mm 65x35



1	Modello	Modelo	Model	Modèle	Modell Triebwerks
2	Numero di fabbrica	Número de matrícula	Serial Number	Numéro de fabrication	Baunummer
3	Portata	Caudal	Flow rate	Débit	Förderleistung
4	Pressione massima	Presión máxima	Maximum pressure	Maximum pressure	Maximaler Druck

1.3 Mechanism and gearbox

Mechanism is the device that permits to transform the electric motor rotary movement in alternate and to actuate the plunger.

1.3.1 Adjustment of the stroke length

To obtain high accuracy performances pump must operate at ideal conditions: constant speed, pressure, viscosity.

Before turning the adjustment knob, release the adjustment by rotating of 1/4 of turn the lock screw.

Models

The variation from 0 to 100% of the maximum flow rate is obtained by rotating the adjustment knob counter clockwise; each revolution of the adjustment knob corresponds to a variation of 1/10 of the maximum capacity; moreover the knob edge is subdivided in 10 parts eachone corresponding to a variation of 1/100 of the maximum flow rate

1.4 Pump head

1.4.1 Operating principle

The packing (5) on the piston (4) seals the pumpheadSuction (1) and discharge (2) valves are operated by positive and negative pressure

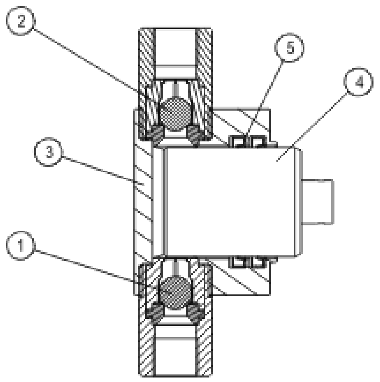
Suction (1) and discharge (2) valves are operated by positive and negative pressure

Suction stroke :

During the suction stroke the difference between the suction pressure and the pressure inside the process head (3) causes the opening of the suction valve (1).
The process liquid is sucked from the suction line into the process chamber (3).

Discharge stroke:

During the discharge stroke the suction valve (1) is closed and the discharge valve (2) will open due to the positive pressure inside the process chamber (3). The process liquid is discharged from the process chamber (3) into the discharge line.



1	Valvola di aspirazione	Válvula de aspiracón	Suction valve	Vanne d’aspira	
2	Valvola di scarico	Válvula de impulsión	Discharge valve	Vanne de refoulement	Auslaßventil
3	Testata	Cabeza	Pump head	Tête	Prozeßkammer
4	Pistone	Pistón	Plunger	Piston	Kolben
5	Tenuta	Junta	Packing	Garniture	Kolbendichtung

1.4.2 Packing

Plunger pumps can be equipped with packing consists of lip seals that don’t require any adjustment.

2. INSTALLATION

2.1 Safety precautions

- don’t work alone
- install a magnetic starter with overload protection
- connect motor to grounding
- when working on the pump verify that electric motor or servomotor are not connected to mains.
- using electric tools in hazardous areas, pay attention to special regulations
- keep available a first aid kit
- observe local law safety regulations

Installation

- Foundation height should be so as to facilitate maintenance operation, handling, oil refill and drain, easy disassembling of pumphead
- Install the pump **free of strain** on its base, pumphead connections and foundation
- Install the pump levelling the piston axis horizontally and the valve axis vertically

Electrical connection

DANGER

Electric motors and electrical components should be connected in accordance with local regulations and by qualified personnel only.
Install overload protection or temperature sensor.
Check voltage, frequency, motor speed and power.
In hazarduous areas special regulations must be applied.

2.2 General

For a good operation, the correct installation of the pump is fundamental:

- Before carrying out hydraulic connections, make sure that the inside of pipes, tanks, etc. have been thoroughly cleaned/washed. However we recommend the installation of a temporary filter near to suction nozzle in order to stop plant residues and slags.
- Connect pipes avoiding nozzles stretching

- Install pipes correctly sized for the maximum flow rate of the pump, avoid necks and tortuosity where air or gas could be entrapped.
- Check valves and cross fittings should be installed both in the suction and discharge lines, this will permit to disassemble the pump without draining the plant and/or to install accessories such as pressure gauges, dampners a.s.o.

WARNING

To prevent serious damages suction and discharge lines must be properly designed, sized and connected to the pump.

2.3 Suction line (see installation recommendations table)

- Install pipe as short as possible (fig. 1) and avoid tortuous paths (fig. 2)
- Pipe should be sized considering that the ratio between the maximum instantaneous flow rate and the average flow rate is 3,14.
- Indicatively the installed pipe should have a diameter equal to 1.5 the diameters of the pump nozzles.
- For your guidance the recommended flow speed inside the pipes should be 0,5÷0,8 m/sec with liquids having viscosity near water and specific gravity up 1200 Kg/m^3.
- A permanent suction filter must be installed . The filter should have a filtering cartridge of 150 μm giving a pressure drop less than 0.2 m.w.c. (calculated according to the a.m. coefficients). The filter should be easily accessible and periodically checked and washed.
- In case of long lines and in order to avoid cavitation problems, install, near the pump, an expansion tank or a damper (fig. 3).

- To prevent suction of impurities don't connect suction line to the bottom of the tank (fig. 4)
- Suction from a vacuum tank can be achieved by connecting pipes as per fig. 5. open check valve 2 and verify the filling through the the window 3, close the check valve 2, start the pump; the non-return valve 4 prevents liquid to flow-back when pump is stopped.

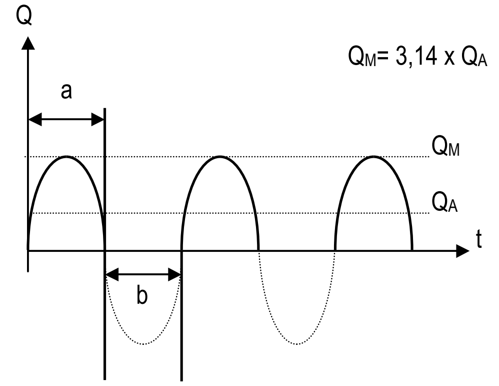


Fig. D

Q	Portata	Caudal	Flow rate	Débit	Förderleistung
Q_A	Portata media	Caudal promedio	Medium Flow rate	Débit moyen	Duchschnittliche
Q_M	Portatamassima	Caudal máximo	Maximum flow rate	Débit maximale	Max. Durchflussmenge
a	Corsa di scarico	Carrera de impulsión	Discharge stroke	Course de refoulement	Auslaßhub
b	Corsa di aspirazione	Carrera de aspiración	Suction stroke	Course d'aspiration	Ansaughub
t	Tempo	Tiempo	Time	Temps	Zeit

2.4 Discharge line (see installation recommendations table, pag. 17)

- Verify that between suction and discharge there is a positive pressure of at least 50÷ 100 Kpa; if the plant conditions don't permit a positive pressure difference, install a back pressure valve on pump discharge (fig. 6) or lower suction tank (fig. 7) or raise discharge pipe (fig. 8)

- For safety reasons it is mandatory to install a pressure relief valve in order to prevent dangers as consequence of unexpected overpressure; the pressure relief valve discharge should be visible and/or piped back to the tank or to a drain.
  We do not recommend to pipe the pressure relief valve discharge to the pump suction line (fig. 9).
- In case a back pressure valve is installed the pressure relief valve must be installed as shown in fig. 10.
- It is recommended the installation of pressure gauges having a range of 20% higher than the pressure relief valve setting.
- To reduce flow pulsation, the installation of a pulsation damper near the discharge valve of the pump is highly recommended.

The most used dampers are:

- dampers with direct contact between process liquid and gas/air cushion (air chamber); this type is of simple concept but it needs frequent checks and restoring of the atmospheric air cushion.

- dampers with diaphragm or bag which separates gas/air from process liquid; they are generally precharged at a pressure equal to 60÷75% of the maximum operating pressure of the pump when installed on the discharge side of the pump.

These dampers require periodic checks to verify diaphragm/bag integrity and correct precharge pressure; they must be selected considering the chemical compatibility of the construction material of diaphragm/bag.
If the pump discharges into a pressurized line, the installation of a non-return valve is recommended.

⇨ When installing pump and accessories it is recommended the installation of check valves in order to facilitate maintenance operations. Fig. 13 shows a typical installation.

⇨ Please observe the following instructions when pumping liquids that tend to cristallize or suspensions that tend to sediment:

- keep suspension correctly agitated in order to prevent sedimentation
- avoid installation of vertical lines over the pump discharge nozzle
- before stopping the pump start a washing cycle of the pump and pipes
- design suction and discharge lines should permit complete emptying

3. START-UP

Electrical connection:

- connect electric motor to mains (power source)
- check the direction of rotation of the electric motor; an arrow on the electric motor shows the correct direction of rotation

The electric motor should be connected by qualified personnel only!

WARNING
Don’t start the pump with the suction and/or discharge check valves closed
Don’t close check valves while the pump is in operation

Before starting the pump check the following points:

- check mechanism for the correct oil filling
- check pumphead for the correct filling of the hydraulic liquid
- check metering pump for overpressure protection (pressure relief valve installation)
- verify that all hydraulic connections are correctly tight
- position adjustment knob at “zero” flow rate (see para 1.3.1)
- start the pump without discharge pressure and increase progressively the flow rate up to 100%
- keep the pump in operation for few minutes

WARNING
DON’T EXCEED THE MAXIMUM PERFORMANCE STENCILLED ON THE PUMP LABEL
If no pressure gauge is fitted on the plant, the installation of a temporary pressure gauge is recommended in order to check that the actual pressure at the start-up doesn’t exceed the maximum allowable pressure.

⇨ pumps are self-priming, however some priming problem could be encountered with pumps having very low flow rate, small plunger diameter, with back pressure valves installed and in presence of high discharge pressure. In these cases it could be necessary to aid priming purging air from pumphead and suction line.

WARNING
If the pumped liquid is toxic, poisonous, aggressive, flammable or for any reason dangerous, use particular care avoiding accidental leakages through gaskets or pipes during start-up or maintenance operations.
Moreover follow all the recommendations of the manufacturer for handling and the local laws relevant to safety during handling and disposal of dangerous substances.

4. MAINTENANCE

4.1 Precautions

- Before servicing pump or plant verify that all electric connections (power and control) have been disconnected from mains and are no more fed.
- Depressurize completely pump and pipes and drain the section in which maintenance is required
- Always work wearing the required safety protections.
- Don't pour in the ambient polluting substances such as pumped chemicals, hydraulic liquid, lubricating oil a.s.o.
- Before servicing pump or plant read carefully the technical specification of the handled fluids with particular respect to the actions that must be done in case of accidental contact with a dangerous fluid.

4.2 Mechanism

Pumps are generally supplied complete with the first oil filling; replace oil after 1500 operation hours and afterwards every 4000 hour.

However replace oil every year .
Use the recommended oils listed here below or equivalent.

Check weekly the oil level and, when required, restore the correct level using the same oil; check also for possible leakages through the lip seal on the piston rod and if necessary replace the lip seal.

AGIP	BP	ESSO	IP	MOBIL	SHELL
BLASIA 150	ENERGOL GR-XP150	SPARTAN EP 150	MELLANA OIL 150	MOBIL GEAR 629	OMALA OIL 150

4.3 Pumphead

Don't let the pump running without process liquid.

As minimum every six months, dismount the pumphead as follows:

- Disconnect suction and discharge pipes
- Drain process liquid rom pump head and pipes
- unscrew bolts fixing the pumphead to mechanism
- dismount suction and discharge valves

and carry out he following operations:

- wash thoroughly the suction and discharge valves and verify whether any part is worn or scratched; replace them if required

- replace plunger packing in case it is worn; grease new seals before assembling
- check the plunger sliding surface where seals operate; the surface should be without scoring or scratches; when damaged replace the plunger

4.4 Recommended spares

In order to face normal service problems and to avoid possible waste of time, we suggest to keep in stock a small supply of the following spares:

- One plunger
- Two sets of plunger packing
- One suction valve complete
- One discharge valve complete

When ordering spares, please indicate always the model and the serial number of the pump

5. TROUBLESHOOTING

Trouble	Possible cause	Remedy
Flow rate too low or no flow rate	Suction tank sealed without vent	Install vent or open tank cover
	Suction of air through fittings, gaskets, etc.	Tighten connections
	Air/gas pockets into the pump or in the pipes	Facilitate air exit
	Suction filter or suction line clogged	Wash filter and/or remove occlusion
	Check valves closed	Open valves
	Excessive suction head	Reposition pump at the correct elevation
	Vapour pressure too high, liquid temperature too high	Cool liquid
	Viscosity too high, liquid temperature too low	Heat liquid
	Pump valves dirty or worn	Wash valves or replace them
	Strokes per minute less than rated	Check speed and electrical feeding
	Suction pipe diameter too reduced	Check suction line for length and diameter
	Pressure relief valve set at a value lower than the maximum discharge pressure	Check pressure relief valve setting and actual operating pressure
	Wrong stroke length	Check stroke length and adjust if required
	Excessive leakage through packing	Tighten packing, check plunger and packing for wear; replace worn parts
	Pressure relief valve in operation or leaking	Check for correct setting and/or clean pressure relief valve
Flow rate too high	Discharge pressure lower than suction pressure	Install a back pressure valve
	Wrong stroke length	Check stroke length and adjust if required
	Back pressure valve faulty or setting pressure inadequate	Reset back pressure valve or replace it
	Strokes per minute more than nominal	Verify electrical feeding
Electric motor overheating	Discharge pressure too high	Check pressure relief valve setting
	Discharge line uncorrectly sized	Check discharge line length and diameter
	Wrong electrical connections	Check and rectify connections
Noisy operation	Lack of lubricant in the mechanism/gearbox	Refill with the correct lubricant
	Excessive wear of the mechanism/gearbox	Overhaul mechanism/gearbox
Pipes vibrations	Pipe diameter too small	Enlarge pipe diameter
	Pulsation damper out of operation or too small	Repair or recalculate damper volume

6. HANDLING AND TRANSPORTATION

6.1 Handling

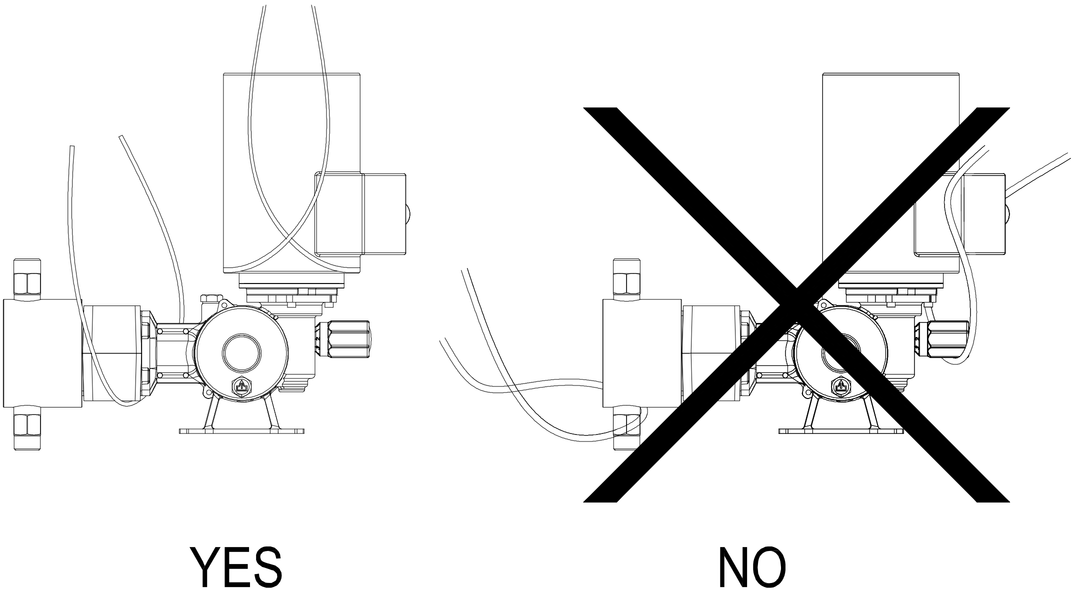
The correct way to handle the pump is shown on the drawing here below.
If the pump is assembled on a baseplate with lifting lugs use them for handling.

⇨ **in any case note the following instructions:**

- **do not sling, pull, push** the pumphead nozzles or flanges
- **do not sling, pull, push** the adjustment knob
- **do not sling, pull, push** the plunger

⇨ **when lifting loads pay attention to the following**

- dress helmet, accident protective shoes and gloves
- do not stand under hanging loads
- do not hand lift overload
- when hand lifting load do not assume position that can be dangerous for the spinal column and dorsal muscles



6.2 Storage and preservation

WARNING

During transportation and during storage pump must be protected against moisture, salt water, rain, sand storm and direct sunligth.

Should the pump be stored for a long time, proceed according to following instructions:

A. Storage in a dry and ventilated place

Pump can be stored for a period of one year without taking any special precaution

B. Storage in places with high humidity

Pump must be hermetically sealed and protected against perspiration using an adequate quantity of silica gel; then storage for one year is possible.

C. Storage outdoor

In addition to recommendation of point B, additional protection against rain, sand, dust, dirty and direct sunlight are required.

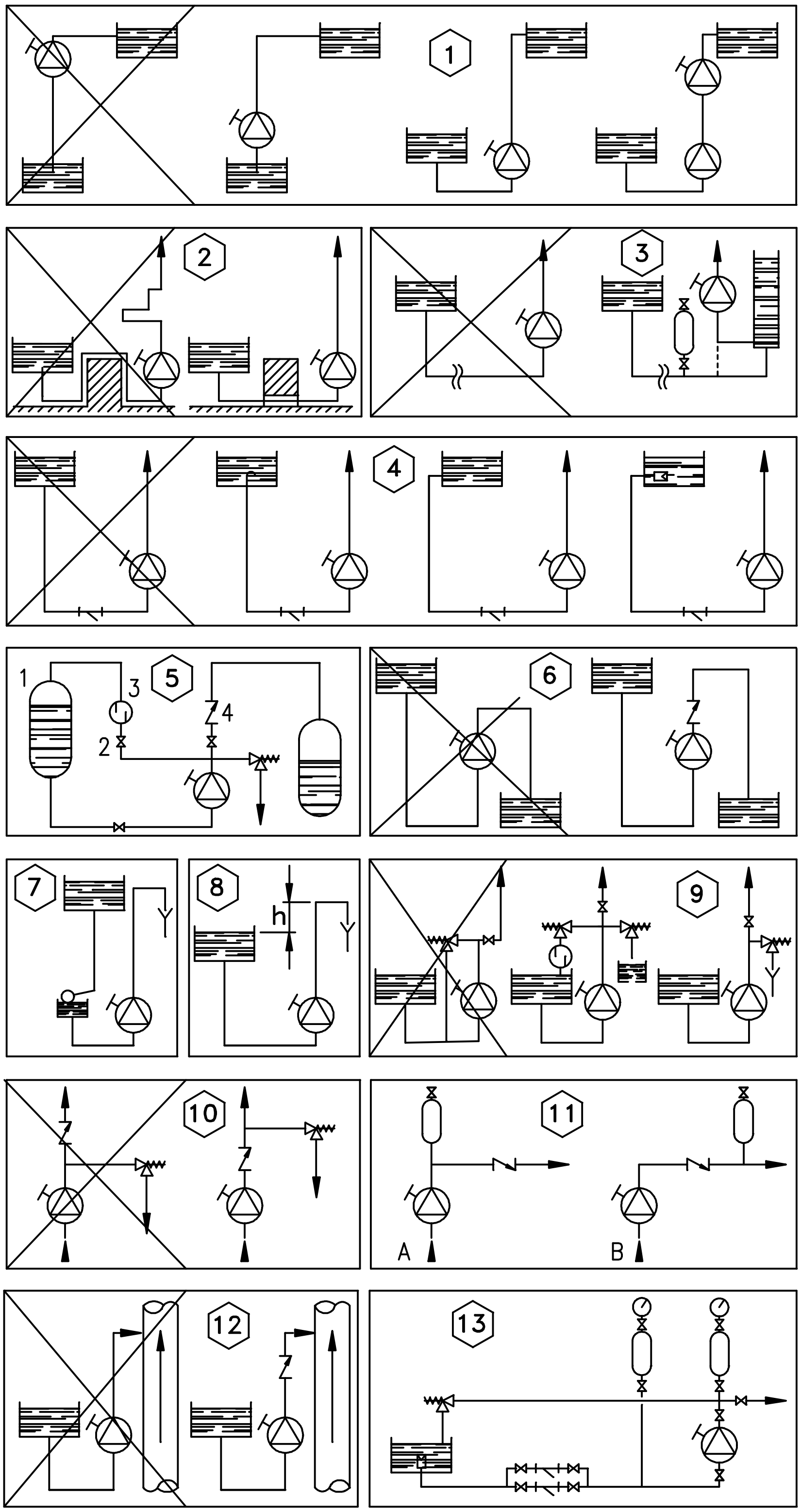
D. Precaution after installation of a pump

Before start-up check that mechanism and hydraulic chamber are correctly filled in.
If the put in operation is delayed, the metering pump should be started for one hour approx. every month with the stroke length at “zero”.

However the lubricant oil of the mechanism must be changed every year.
Replace again the lubricant oil in the mechanism before the actual start in operation.
Should the pump be out of operation for a long period after installation, the additional following precautions must be taken:

- disassemble pumphead completely and wash all parts carefully
- disassemble, clean and grease the packing; reassemble it without tightening the packing gland
- grease all machined parts
- pour protective lubricant into the movement and gearbox; operate the pump for some minute
- when restarting, drain protective lubricant and refill with suitable lubricant
- keep the pump in a dry place and adequately protected from dust

Installation suggestions table



SERBATOIO TANK TANK	DEPÓSITO RESERVOIR
POMPA DOSATRICE DOSING PUMP DOSIERPUMPE	BOMBA DOSIFICADORA POMPE DOSEUSE
POMPA AUSILIARIA BOOSTER PUMP HILFSPUMPE	BOMBA AUXILIARA POMPE AUXILIAIRE
POLMONE SMORZATORE PULSATION DAMPER PULSATIONDÄMPFER	DEPÓSITO DE COMPENSACIÓN POUMON AMORTISSEUR
VALVOLA ON-OFF VALVE VENTIL	VÁLVULA VANNE
SERBATOIO IN PRESSIONE PRESSURIZED TANK TANK UNTER DRUCK	DEPÓSITO EN PRESIÓN RESERVOIR PRESSUR
FILTRO A “Y” “Y” FILTER “Y” FILTER	FILTRO DE “y” FILTRE A “Y”
SPIA WINDOW SCHAULGLAS	MIRILLA TEMOIN
VALVOLA DI CONTROPRESSIONE CHECK VALVE GEGENDRUCKVENTIL	VÁLVULA DE CONTRAPRESIÓN VANNE DE CONTREPRESSION
VALVOLA DI SICUREZZA PRESS RELIEF VALVE SICHERHEITSVENTIL	VÁLVULA DE SEGURIDAD VANNE DE SECURITE
VALVOLA A GALLEGGIANTE FLOAT-OPERATED VALVE SCHWIMMERVENTIL	VÁLVULA FLOTANTE VANNE A FLOTTEUR
MANOMETRO PRESSURE GAUGE MANOMETER	MANÓMETRO MANOMETRE

Bedienungs-, Wartungs- und Installationshandbuch
KOLBENDOSIERPUMPEN

Wir empfehlen Ihnen, die Anweisungen vor der Installation und Inbetriebnahme der Pumpe aufmerksam zu lesen.
Die Informationen dieses Handbuchs können ohne jede Vorankündigung geändert werden

INHALTSVERZEICHNIS

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1.4 Kopf
1.4.1 Funktionsprinzip
1.4.2 Dichtung

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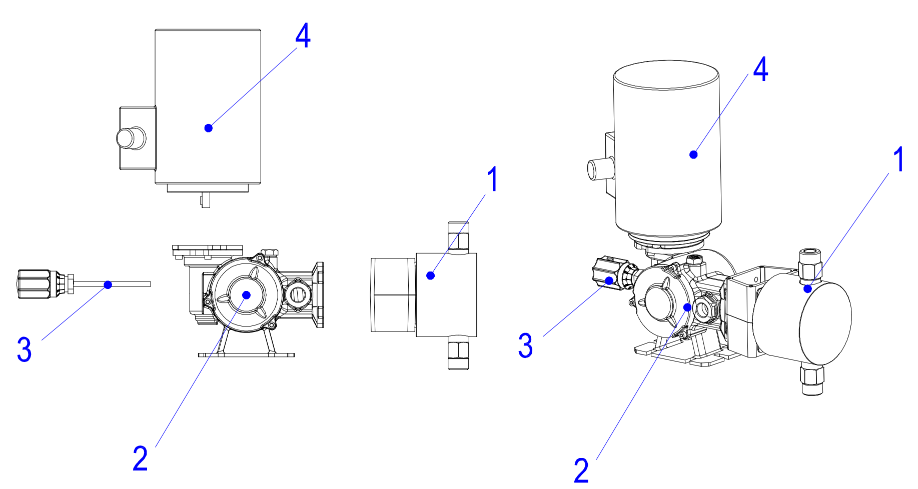
4.3 Kopf
4.4 Empfohlene Ersatzteile

5. ERKENNEN VON STÖRUNGEN

6. TRANSPORT UNG EINLAGERUNG
6.1 Transport
6.2 Einlagerung und Aufbewahrung

Tabelle der Empfehlungen für die Installation

1. BESCHREIBUNG



1	Testata	Cabeza	Pump head	Tête	Pumpenkopf
2	Meccanismo	Mecanismo	Mechanism	Mecanisme	Triebwerk
3	Regolazione	Regulaciòn	Adjustment	Régulation	Hubeinstellung
4	Motore	Motor	Motor	Moteur	Motor

Die Dosierpumpe ist eine volumetrische, alternierende Pumpe, deren Hauptkomponenten der Motor (normalerweise elektrisch), das Untersetzungsgetriebe, das Getriebe, die Einstellvorrichtung des Laufs und der Pumpkopf sind.

⇨ **Die Dosierpumpe wurde in Übereinstimmung mit den italienischen Regelungen für Sicherheit und Prävention hergestellt.**

Anweisungen für die Sicherheit

ACHTUNG

Das Überschreiten des zulässigen Maximaldrucks vermeiden (zum Beispiel durch Installation eines Sicherheitsventils)

Vor dem Beginn der Arbeit mit der Pumpe das Folgende aufmerksam überprüfen:

- dass der Elektromotor vom Speisungsnetz abgeklemmt wurde
- dass der Druck vom Kopf und den Rohrleitungen abgelassen wurde
- dass Teile in Kontakt mit aggressiven und/oder gefährlichen Flüssigkeiten vor dem Umgang mit ihnen sorgfältig gewaschen worden sind
- dass die Bediener die von den geltenden Gesetzen vorgesehenen persönlichen Schutzvorrichtungen tragen

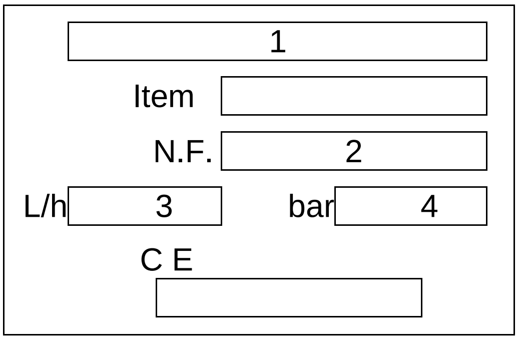
1.1 Anwendungen

Bei der Dosierpumpe handelt es sich um eine Prozesskomponente, die in der Lage ist, bestimmte Flüssigkeitsmengen mit sehr hoher Präzision zu trasportieren; außerdem ist es möglich, mittels einer entsprechenden Vorrichtung, die Förderleistung zu variieren.
Zum Erhalt der besten Leistungen müssen bei der Wahl der Pumpe die geforderten Leistungen und die Kompatibilität der Konstruktionsmaterialien der Teile, die mit der Flüssigkeit in Kontakt sind, in Betracht gezogen werden.

Vor der Verwendung einer Pumpe für eine andere Anwendung als die urspüngliche, empfehlen wir, bei unserer Technischen Abteilung Informationen einzuholen.

1.2 Identifikationsschild

Effektive Abmessungen: mm 65x35



1	Modello	Modelo	Model	Modèle	Modell Triebwerks
2	Numero di fabbrica	Número de matrícula	Serial Number	Numéro de fabrication	Baunummer
3	Portata	Caudal	Flow rate	Débit	Förderleistung
4	Pressione massima	Presión máxima	Maximum pressure	Maximum pressure	Maximaler Druck
5	Riferimenti	Referencias	Reference	Références	Bezugdaten

1.3 Getriebe und Untersetzungsgetriebe

Beim Getriebe handelt es sich um eine Vorrichtung, die die Rotationsbewegung des Elektromotors in eine alternierende Bewegung umformt und den Kolben bewegt.

1.3.1 Einstellung des Laufs

Zum Erhalt eines Höchstmaßes an Präzision muss die Pumpe unter idealen Bedingungen arbeiten, d. h. mit konstanter Geschwindigkeit, konstantem Druck und konstanter Viskosität.

Vor der Betätigung des Drehknopfes die Einstellung entsperren, indem die Arretierschraube um eine Vierteldrehung im Gegenuhrzeigersinn gedreht wird.

Modelle

Die Variation der maximalen Förderleistung von 0 auf 100% wird erreicht, indem der Einstelldrehknopf im Gegenuhrzeigersinn gedreht wird; jeder Drehung des Drehknopfs entspricht eine Variation von 1/10 der maximalen Förderleistung; außerdem ist der Drehknopf in 10 Teile unterteilt, die jeweils 1/100 der maximalen Förderleistung entsprechen.

1.4 Kopf

1.4.1 Funktionsprinzip

Die Dichtung (5) auf dem Kolben (4) isoliert den Kopf vor der Umgebung; die Ansaugventile (1) und die Auslassventile (2) werden durch das Abwechseln positiven und negativen Drucks betätigt.

Die Ansaugventile (1) und die Auslassventile (2) werden durch das Abwechseln von positivem und negativem Druck betätigt.

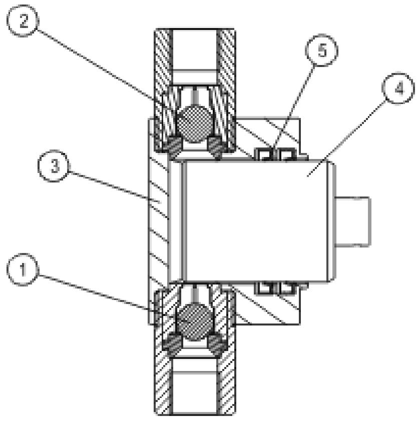
Ansaugen

Während des Ansauglaufs (zurückgehender Kolben) bewirkt der Unterschied zwischen dem Ansaugdruck und dem Druck im Kopf (3) das Öffnen des Ansaugventils (1).

Die Prozessflüssigkeit wird von der Ansaugleitung ins Innere des Kopfes (3) gesaugt.

Auslassen

Während des Auslasslaufs (vorschiebender Kolben) ist das Ansaugventil (1) geschlossen und das Auslassventil (2) öffnet sich durch den Druck im Inneren des Kopfes (3). Die Prozessflüssigkeit wird vom Kopf (3) in die Auslassleitung gepumpt.



1	Valvola di aspirazione	Válvula de aspiracón	Suction valve	Vanne d’aspira	
2	Valvola di scarico	Válvula de impulsión	Discharge valve	Vanne de refoulement	Auslaßventil
3	Testata	Cabeza	Pump head	Tête	Prozeßkammer
4	Pistone	Pistón	Plunger	Piston	Kolben
6	Tenuta	Junta	Packing	Garniture	Kolbendichtung

1.4.2 Dichtung

Die Kolbenpumpen sind ausgestattet mit den dightung Sie bestehen aus Elastomerlippenringen und erfordern keine Einstellung.

2. *INSTALLATION*

2.1 Sicherheitsmaßnahmen

Um die Unfallrisiken während der Installation zu minimieren, den Anweisungen des Abschnitts 6.1 folgen und außerdem:

- Nicht alleine arbeiten
- Einen Fernschalter mit Thermoschutz installieren
- Die Erdung des Motors verbinden
- Sich beim Arbeiten mit der Pumpe dessen versichern, dass der Elektromotor oder der Servomotor nicht an das Netz angeschlossen sind
- Bei Verwendung von Elektrogeräten in gefährlichen Bereichen, die spezifischen Regelungen einhalten
- Ein Erste-Hilfe-Kit griffbereit halten
- Die lokalen Sicherheitsgesetze beachten

Installation

- Die Installationshöhe muss so vorgesehen werden, dass die Wartungsvorgänge, der Transport, das Abladen, das Nachfüllen von Schmiermittel und die Demontage des Kopfes vereinfacht werden.
- Die Pumpe **ohne Spannungen** auf dem Untergestell und den Verbindungen des Kopfes installieren.
- Die Pumpe horizontal mit der Achse des Kolbens und vertikal mit der Achse der Ventile installieren

Elektrische Verbindungen

GEFAHR
Die Motoren und die elektrischen Komponenten müssen in Übereinstimmung mit den lokalen Gesetzen und ausschließlich durch Fachpersonal angeschlossen werden.
Einen Überlastschutz oder einen Temperatursensor installieren.
Die Voltzahl, die Frequenz, die Geschwindigkeit des Motors und die Leistung überprüfen.
In gefährlichen Bereichen die spezifischen Verfügungen/Gesetze beachten.

2.2 Allgemeines

Für ein gutes Funktionieren ist es wesentlich, dass die Pumpe korrekt installiert ist:

- Sich vor der Ausführung der hydraulischen Verbindungen dessen versichern, dass das Innere der Rohrleitungen, Tanks, etc. sorgfältig gereinigt wurde; es ist in jedem Fall ratsam in der Nähe der Ansaugdüse einen vorläufigen Filter zu installieren, der die Überreste und die Ablagerungen der Anlage sammelt.
- Die Rohrleitungen anschließen und dabei vermeiden, die Düsen der Pumpe unter Spannung zu setzen
- Rohrleitungen mit passendem Durchmesser für die maximale Förderleistung der Pumpe installieren und Drosselstellen oder gewundene Verläufe vermeiden, die Luft- oder Gaseinschlüsse verursachen könnten.
- Vor und nach dem Kopf ein Absperrventil und eine Kreuzverbindung installieren; das ermöglicht das Demontieren der Pumpe, ohne die Anlage zu entleeren und das Installieren eventueller Zubehörteile wie Manometer, Dämpfer, etc.
- Wärmedehnungsverbindungen einsetzen, wenn Flüssigkeiten mit hoher Temperatur gepumpt werden
- Bei Köpfen aus Plastikmaterial sowohl für Ansaugen, als auch für Auslass flexible Verbindungen installieren.
- Die hydraulisch gesteuerten Pumpen von funktionieren mit einem NPSH von bis zu 70 Kpa ass. gleich 7 m.c.a.. (NPSH = Net Positive Suction Head), trotzdem ist zur Verbesserung der Dosierungspräzision und zur Beschleunigung des Anfüllens eine leicht unterschächtige Installation vorzuziehen.

ACHTUNG

Um ernsthaften Schäden zuvorzukommen, müssen die Ansaug- und Auslassleitungen richtig geplant, dimensioniert und mit der Pumpe verbunden werden.

2.3 Ansaugleitung (siehe Tabelle der Empfehlungen für die Installation)

- Die Rohrleitung so kurz wie möglich vorsehen (Abb. 1), gewundene Verläufe vermeiden (Abb. 2).
- Bei der Dimensionierung der Rohrleitung muss bedacht werden, dass das Verhältnis zwischen der maximalen augenblicklichen Förderleistung und der Durchschnittsförderleistung 3,14 für Simplexpumpen (Abb. D, Seite 9), 1,5 für Duplexpumpen (mit um 180° verschobenen Kolben) und 1, 05 für Triplexpumpen (mit um 120° verschobenen Kolben) beträgt.
- Die installierte Rohrleitung müsste einen Durchmesser von ungefähr 1,5 Mal dem Durchmesser der Pumpendüsen aufweisen.
- Zu Ihrer Information: Die in den Rohrleitungen empfohlene Geschwindigkeit müsste mit Flüssigkeiten mit einer dem Wasser ähnlichen Viskosität und einem spezifischen Gewicht von bis zu 1200 kg/m3 0,5÷0,8 m/Sek. betragen.
- Einen permanenten Ansaugfilter installieren; der Filter muss über eine Filterkartusche von 150 μm und einen Gefälleverlust von unter 0,2 m.c.a. (unter Beachtung der obengenannten Koeffizienten berechnet) verfügen. Der Filter muss leicht zugänglich sein und regelmäßig kontrolliert/gereinigt werden.
- Bei langen Rohrleitungen, zum Vermeiden von Hohlsogbildungen, in der Nähe der Pumpe ein Expansionsgefäß oder einen Dämpfer installieren (Abb. 3) .
- Die Pumpe nicht an den Boden des Tanks anschließen (Abb. 4), um das Ansaugen von Unreinheiten zu vermeiden.
- Das Ansaugen von einem Vakuumtank ist durch Anschließen der Rohrleitungen gemäß Abb. 5 möglich. Das Ventil 2 öffnen und das Auffüllen mittels des Schauglases 3 überprüfen, das Ventil 2 schließen und die Pumpe wieder starten; das Rückschlagventil 4 verhindert den Rückfluss der Flüssigkeit bei stillstehender Pumpe.

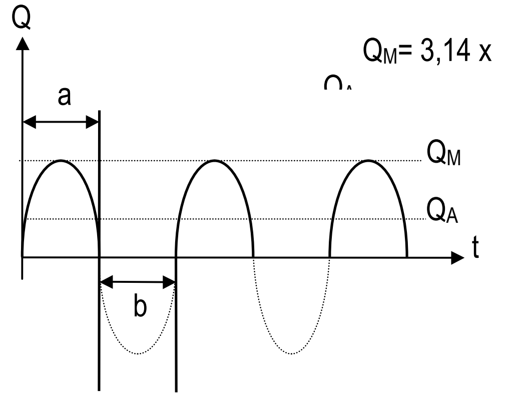


Fig. D

Q	Portata	Caudal	Flow rate	Débit	Förderleistung
Q_A	Portata media	Caudal promedio	Medium Flow rate	Débit moyen	Duchschnittliche
Q_M	Portatamassima	Caudal máximo	Maximum flow rate	Débit maximale	Max. Durchflussmenge
a	Corsa di scarico	Carrera de impulsión	Discharge stroke	Course de refoulement	Auslaßhub
b	Corsa di aspirazione	Carrera de aspiración	Suction stroke	Course d'aspiration	Ansaughub
t	Tempo	Tiempo	Time	Temps	Zeit

2.4 Auslassleitung (siehe Tabelle der Empfehlungen für die Installation, Seite 17)

- Überprüfen, dass es zwischen Auslass und Ansaugung einen positiven Druckunterschied von wenigstens 50÷100 Kpa gibt; Wenn die Anlagezustände keinen positiven Unterschied zulassen, kann man den Zweck erreichen, indem ein Gegendruckventil (Abb. 6) installiert, der Ansaugtank (Abb. 7) abgesenkt oder die Auslassleitung (Abb. 8) erhöht wird.
- Aus Sicherheitsgründen muss ein Sicherheitsventil installiert werden, um Schäden durch unvorhergesehenen Überdruck vorzubeugen, der Auslass des Sicherheitsventils muss sichtbar sein und mit dem Tank oder einer Drainage verbunden werden. Es ist nicht ratsam, den Auslass an die Ansaugung der Pumpe (Abb. 9) anzuschließen.
- Sollte ein Gegendruckventil installiert worden sein, das Sicherheitsventil wie in Abb. 10 angegeben installieren.
- Es ist ratsam, die Manometer mit einer Skala von 20% über dem Eichungsdruck des Sicherheitsventils zu installieren.
- Zur Reduzierung der Pulsationen ist die Installation eines Dämpfers in der Nähe des Auslassventils der Pumpe ratsam.

Die am meisten verwendeten Dämpfer sind:

- Dämpfer in direktem Kontakt mit der Prozessflüssigkeit und dem Luftsack (L fach konzipiert, erfordern aber regelmäßige Kontrollen und Wiederherstellungen des Luftsacks.
- Membran- oder Sackdämpfer, die den Luft-/Gassack von der Prozessflüssigkeit trennen; der Vorspanndruck beträgt normalerweise 60÷75% des maximalen Betriebsdrucks für die Installation auf dem Auslass

Die Dämpfer müssen regelmäßig kontrolliert werden, um die Unversehrtheit der Membran/des Sacks und den richtigen Vorspanndruck zu überprüfen; die Wahl der Dämpfer muss unter Beachtung der chemischen Verträglichkeit der Materialien der in Kontakt befindlichen Teile erfolgen.
Sollte ein Gegendruckventil installiert sein, den Dämpfer wie in Abb. 11 dargestellt montieren.

A) Bei niedrigem Druck muss der Vorspanndruck des Dämpfers für ein richtiges Funktionieren über dem Eichungsdruck des Gegendruckventils liegen.
B) bei hohem Druck

Für weitere Informationen bezüglich der Installation und der Dimensionierung der Dämpfer kontaktieren Sie bitte unsere Technische Abteilung.

Wir empfehlen die Installation eines Rückschlagventils, falls der Auslass der Pumpe in eine Druckleitung ablässt.

⇨ Während der Installation der Pumpe und der Zubehörteile ist es ratsam, auch die Absperrventile vorzusehen, um die Wartungsvorgänge zu vereinfachen; die Abb. 13 zeigt eine typische Installation.
⇨ Den folgenden Anweisungen folgen, wenn Flüssigkeiten gepumpt werden müssen, die dazu tendieren zu kristallisieren oder Suspensionen, die dazu neigen zu sedimentieren:

- Um dem Ablagern zuvorzukommen, die Suspension richtig gemischt halten
- Die Installation vertikaler Leitungen über der Auslassdüse vermeiden
- Vor dem Anhalten der Pumpe einen Reinigungszyklus der Pumpe und der Rohrleitungen vorsehen
- Die Konstruktion der Ansaug- und Auslassleitungen muss die komplette Drainage vorsehen.

3. STARTEN

Elektrische Verbindungen:

- Den Elektromotor mit dem Netz verbinden.
- Die Rotationsrichtung überprüfen; ein Pfeil auf dem Motor zeigt die richtige Rotationsrichtung an

Der Elektromotor darf nur von Fachpersonal angeschlossen werden!

⚠

ACHTUNG

Die Pumpe nicht mit geschlossenen Ansaug-/Auslassventilen starten.
Die Ventile nicht schließen, wenn die Pumpe in Betrieb ist.

Vor der Inbetriebnahme der Pumpe, die folgenden Punkte überprüfen:

- Den Ölpegel des Getriebes kontrollieren.
- Den Pegel der Hydraulikflüssigkeit des Kopfes kontrollieren.
- Kontrollieren, dass die Pumpe gegen Überdruck (Installation des Sicherheitsventils) geschützt ist.
- Überprüfen, dass alle Hydraulikverbindungen richtig angezogen sind.
- Den Einstelldrehknopf auf “Null” stellen, siehe Paragraph 1.3.1.
- Die Pumpe ohne den Auslassdruck starten und die Förderleistung fortschreitend bis auf 100% erhöhen.
- Überprüfen, dass die Flüssigkeit in der Hydraulikkammer keine Luftblasen enthält; das Rückstellventil bis zum kompletten Austreten der Luft drücken
- Die Pumpe einige Minuten in Betrieb lassen
- Den Druck progressiv erhöhen, bis die geforderten Leistungen erreicht werden.

ACHTUNG

NICHT DIE AUF DAS SCHILD DER PUMPE AUFGEDRUCKTEN MAXIMALLEISTUNGEN ÜBERSCHREITEN

Wenn die Anlage nicht über ein Manometer verfügt, empfehlen wir die Installation eines vorläufigen Manometers, um zu kontrollieren, dass der effektive Druck bei der Inbetriebnahme nicht den zulässigen Höchstdruck überschreitet.

⇨ Die Pumpen von sind selbstansaugend; trotzdem könnten einige Füllprobl lriger Förderleistung, Kolben mit kleinem Durchmesser und bei Vorhandensein von Gegendruckventilen auftreten. In diesen Fällen könnte es nötig sein, das Füllen zu fördern, indem die Luft aus dem Kopf und der Ansaugleitung abgelassen wird.

ACHTUNG

Wenn die gepumpte Flüssigkeit toxisch, giftig, aggressiv, entzündlich oder aus irgendeinem Grund gefährlich ist, besonders aufpassen und versehentliche Verluste über die Dichtungen oder die Rohrleitungen während des Starts oder der Wartungsvorgänge vermeiden.
Während des Transports und der Entsorgung der gefährlichen Substanzen, allen Empfehlungen des Lieferanten und den lokalen Sicherheitsgesetzen folgen.

4. WARTUNG

4.1 Vorsichtsmaßnahmen

- Sich vor dem Arbeiten mit der Pumpe dessen versichern, dass alle elektrischen Verbindungen (von Leistung und Kontrolle) vom Netz abgeklemmt sind und, dass sie nicht mehr gespeist werden.
- Den Druck der Pumpe und der Rohrleitung komplett ablassen und den Bereich, in dem die Wartung durchgeführt werden muss, trockenlegen.
- Beim Arbeiten immer die verlangten Sicherheitsschutzvorrichtungen tragen.
- Die verschmutzenden Substanzen wie chemische Produkte, Schmieröl, etc. nicht in die Umwelt schütten
- Vor der Wartung der Pumpe oder der Anlage, aufmerksam die technischen Spezifikationen der gepumpten Flüssigkeit mit besonderem Augenmerk auf die bei versehentlichem Kontakt mit gefährlichen Flüssigkeiten zu treffenden Maßnahmen lesen.

4.2 Getriebe

Die Pumpen werden im Allgemeinen mit der ersten Ölfüllung geliefert; das Öl der ersten Füllung nach 1.500 Betriebsstunden und danach alle 4.000 Stunden ersetzen.
In jedem Fall das Öl jedes Jahr ersetzen
Die in der untenstehenden Tabelle empfohlenden Öle oder äquivalente Öle verwenden.
Wöchentlich den Ölspiegel überprüfen und, wenn nötig mit demselben Öl nachfüllen; auch überprüfen, dass keine Verluste über die Dichtung der Kolbenstange auftreten und, wenn nötig, die Dichtlippe ersetzen.

AGIP	BP	ESSO	IP	MOBIL	SHELL
BLASIA 150	ENERGOL GR-XP150	SPARTAN EP 150	MELLANA OIL 150	MOBIL GEAR 629	OMALA OIL 150

4.3 Kopf

Die Pumpe nicht ohne Flüssigkeit betreiben

Mindestens alle sechs Monate, den Kopf, wie im Folgenden angegeben, demontieren:

- Die Ansaug- und Auslassrohrleitungen lösen.
- Die Prozessflüssigkeit des Kopfes und der Rohrleitungen ablassen.
- Die Befestigungsschrauben des Kopfes am Getriebe lösen.
- Die Ansaug- und Auslassventile demontieren.

Und die folgenden Arbeitsgänge durchführen:

- Die Ansaug- und Auslassventile sorgfältig reinigen und überprüfen, ob Teile verschlissen oder eingeritzt sind; wenn ja, ersetzen.
- Die Dichtungsringe ersetzen, wenn sie verschlissen sind; die neuen Ringe mit Fett bestreichen, bevor sie montiert werden.
- Den Gleitbereich der Dichtung auf dem Kolben überprüfen; die Oberfläche darf keine Rillen oder Schürfungen aufweisen; ersetzen, wenn beschädigt.

4.4 Empfohlene Ersatzteile

Um normale Wartungsvorgänge vornehmen zu können und Zeitverluste zu vermeiden, empfehlen wir Ihnen, wenigstens die folgenden Ersatzteile auf Lager zu haben:

- Einen Kolben
- Zwei Reihen Kolbendichtungen
- Ein komplettes Ansaugventil
- Ein komplettes Auslassventil
- Eine Reihe von Dichtungen des Getriebes

Bei Bestellung der Ersatzteile bitten wir Sie, immer das Pumpenmodell und die Fabrikationsnummer mitzuteilen.

5. ERKENNEN VON STÖRUNGEN

Störung	Possibile causa	Abhilfe
Niedrige oder keine Förderleistung	Versiegelter Tank ohne Entlüftung	Eine Entlüftung installieren oder den Deckel des Tanks öffnen
	Luft- oder Gaseinschlüsse in der Pumpe oder den Rohrleitungen	Die Anschlüsse anziehen
	Filter oder Ansaugleitung verstopft	Das Austreten der Luft fördern
	Absperrventile geschlossen	Den Filter reinigen und/oder die Einschließung entfernen
	Zu große Ansaughöhe	Ventile öffnen
	Dampfspannung und/oder Temperatur der Flüssigkeit zu hoch	Die Pumpe wieder auf der richtigen Höhe positionieren
	Zu hohe Viskosität, Flüssigkeitstemperatur zu niedrig	Die Flüssigkeit abkühlen
	Ventile der Pumpe schmutzig oder verschlissen	Die Flüssigkeit erhitzen
	Läufe/Min. unter dem Nominalwert	Die Ventile reinigen oder ersetzen
	Durchmesser der Ansaugrohrleitung zu klein	Die Geschwindigkeit und die elektrische Speisung überprüfen
	Sicherheitsventil auf einen Wert unter dem maximalen Auslassdruck geeicht	Die Länge und den Durchmesser der Leitung überprüfen
	Falsche Länge des Laufes	Die Eichung des Ventils und den effektiven Betriebsdruck überprüfen
	Zu große Verluste über die Dichtung	Kontrollieren und wie nötig einstellen
	Sicherheitsventil in Betrieb, Verluste über das Ventil	Die Dichtung komprimieren, den Verschleiß des Kolbens und der Dichtung überprüfen und die verschlissenen Teile ersetzen
		Die richtige Eichung überprüfen und/oder das Ventil reinigen
Zu hohe Förderleistung	Auslassdruck niedriger als der Ansaugdruck	Ein Gegendruckventil installieren
	Falsche Länge des Laufs	Kontrollieren und wie nötig einstellen
	Gegendruckventil defekt oder mit falscher Eichung	Die Eichung ändern oder das Ventil ersetzen
	Läufe/ Min. über dem Nominalwert	Die Geschwindigkeit und die Stromspeisung überprüfen
Überhitzung des Elektromotors	Zu hoher Auslassdruck	Die Eichung des Sicherheitsventils kontrollieren
	Nicht richtig dimensionierte Auslassleitung	Die Länge und den Durchmesser der Leitung überprüfen
	Falsche elektrische Verbindungen	Überprüfen und die Verbindungen korrigieren
Lauter Betrieb	Fehlen von Schmiermittel im Getriebe und/oder Untersetzungsgetriebe	Mit geeignetem Schmiermittel auffüllen
	Zu großer Verschleiß des Getriebes und/oder des Untersetzungsgetriebes	Das Getriebe und/oder das Untersetzungsgetriebe überholen
Schwingungen in den Rohrleitungen	Durchmesser der Rohrleitungen zu klein	Den Durchmesser der Rohrleitungen erhöhen
	Dämpfer zu klein und/oder außer Betrieb	Reparieren oder das Volumen des Dämpfers neu berechnen

6. *TRANSPORT UND EINLAGERUNG*

6.1 Transport

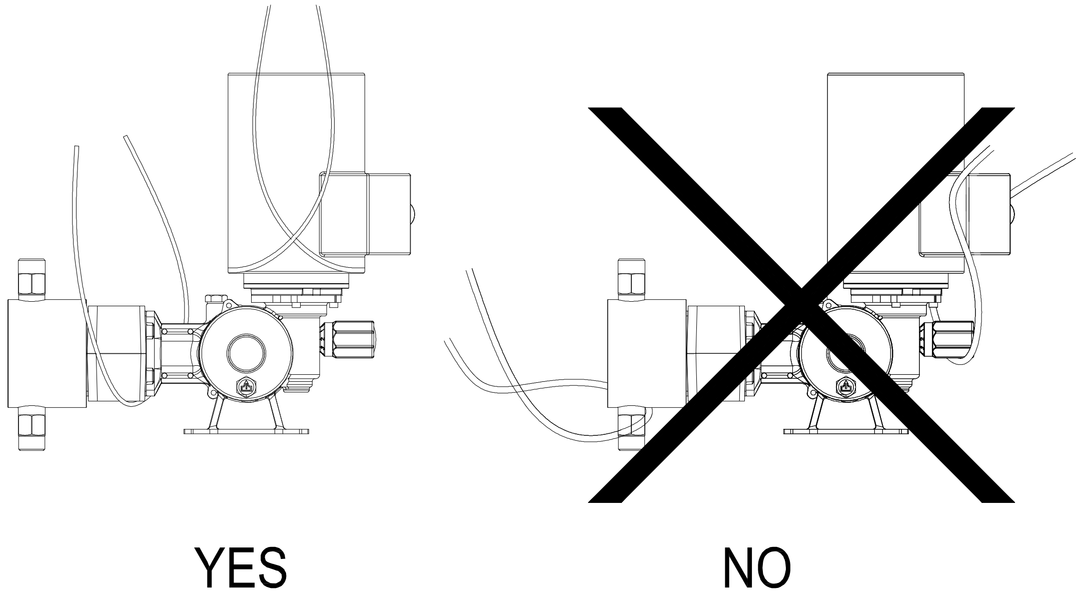
Die untenstehende Abbildung zeigt die richtige Transportweise der Pumpe.
Ist die Pumpe auf einem Gestell mit Hubösen montiert, letztere für den Transport verwenden.

⇨ **In jedem Fall die folgenden Anweisungen beachten:**

- Die Flansche oder die Düsen des Kopfes nicht anschlagen, ziehen oder schieben
- Das Gehäuse des Sicherheitsventils nicht anschlagen, ziehen oder schieben
- Den Einstelldrehknopf nicht anschlagen, ziehen oder schieben
- Den Kolben nicht anschlagen, ziehen oder schieben

⇨ **beim Anheben von Lasten das Folgende beachten**

- Helm, Handschuhe und Sicherheitsschuhe tragen
- Sich nicht unter hängenden Lasten aufhalten
- Keine zu großen Lasten von Hand anheben
- Beim manuellen Anheben der Lasten keine Positionen einnehmen, die der Wirbelsäule und den Rückenmuskeln schaden könnten.



6.2 Einlagerung und Aufbewahrung

ACHTUNG

Während des Transports und der Lagerung der Pumpe muss sie gegen Feuchtigkeit, Salzwasser, Regen, Staub, Sand und direkte Sonnenbestrahlung geschützt werden.

Sollte die Pumpe lange Zeit eingelagert werden, den folgenden Anweisungen folgen:

A. Einlagerung an trockenem und belüftetem Ort
Die Pumpe kann für einen Zeitraum von einem Jahr ohne besondere Vorsichtsmaßnahmen eingelagert werden.

B. Einlagerung an Ort mit hoher Feuchtigkeit
Die Pumpe muss hermetisch gegen Kondenswasser geschützt werden, indem eine passende Menge an Kieselgelsalzen verwendet wird; unter diesen Bedingungen ist eine Einlagerung für ein Jahr möglich.

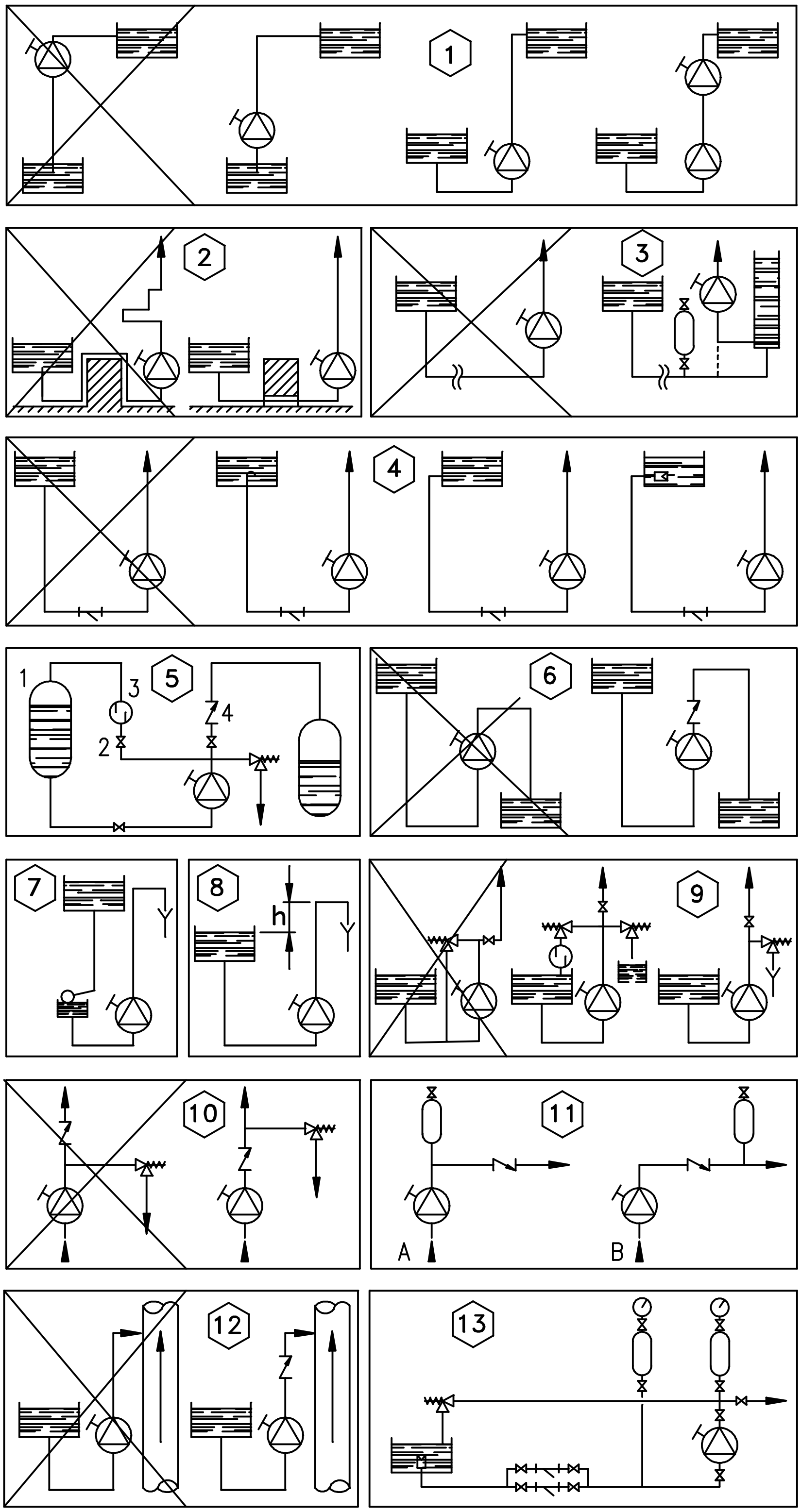
C. Einlagerung draußen
Zusätzlich zu den Empfehlungen des Punktes B werden weitere Schutzvorrichtungen gegen Regen, Sand, Staub, Unreinheiten und direkte Sonnenbestrahlung gefordert.

D. Vorsichtsmaßnahmen nach der Installation einer Pumpe
Vor der Inbetriebnahme kontrollieren, dass das Getriebe und die Hydraulikkammer richtig aufgefüllt sind.
Sollte die Inbetriebnahme aufgeschoben werden, die Pumpe jeden Monat eine Stunde mit dem Einstelldrehkonpf auf “Null”, siehe Paragraph 1.3.1, betätigen.

Das Schmiermittel in jedem Fall jedes Jahr ersetzen.
Das Schmiermittel des Getriebes vor der effektiven Inbetriebnahme der Pumpe von Neuem ersetzen.
Sollte die Pumpe nach der Installation für einen langen Zeitraum inaktiv bleiben, die folgenden Vorsichtsmaßnahmen beachten:

- Den Kopf komplett demontieren und alle Teile sorgfältig reinigen
- Die Dichtung demontieren, reinigen und schmieren; neu montieren ohne die Stopfbuchse zu komprimieren
- Alle bearbeiteten Oberflächen fetten
- Schutzschmiermittel in das Getriebe und das Untersetzungsgetriebe schütten und die Pumpe einige Minuten betätigen.
- Im Moment der Inbetriebnahme das Schutzschmiermittel ablassen und mit passendem Schmiermittel auffüllen
- Die Pumpe an trockenem Ort, passend vor Staub geschützt, aufbewahren

Tabelle der Empfehlulngen für die installation



SERBATOIO TANK TANK	DEPÓSITO RESERVOIR
POMPA DOSATRICE DOSING PUMP DOSIERPUMPE	BOMBA DOSIFICADORA POMPE DOSEUSE
POMPA AUSILIARIA BOOSTER PUMP HILFSPUMPE	BOMBA AUXILIARA POMPE AUXILIAIRE
POLMONE SMORZATORE PULSATION DAMPER PULSATIONDÄMPFER	DEPÓSITO DE COMPENSACIÓN POUMON AMORTISSEUR
VALVOLA ON-OFF VALVE VENTIL	VÁLVULA VANNE
SERBATOIO IN PRESSIONE PRESSURIZED TANK TANK UNTER DRUCK	DEPÓSITO EN PRESIÓN RESERVOIR PRESSUR
FILTRO A “Y” “Y” FILTER “Y” FILTER	FILTRO DE “y” FILTRE A “Y”
SPIA WINDOW SCHAULGLAS	MIRILLA TEMOIN
VALVOLA DI CONTROPRESSIONE CHECK VALVE GEGENDRUCKVENTIL	VÁLVULA DE CONTRAPRESIÓN VANNE DE CONTREPRESSION
VALVOLA DI SICUREZZA PRESS RELIEF VALVE SICHERHEITSVENTIL	VÁLVULA DE SEGURIDAD VANNE DE SECURITE
VALVOLA A GALLEGGIANTE FLOAT-OPERATED VALVE SCHWIMMERVENTIL	VÁLVULA FLOTANTE VANNE A FLOTTEUR
MANOMETRO PRESSURE GAUGE MANOMETER	MANÓMETRO MANOMETRE

Manual de uso, mantenimiento e instalación
BOMBAS DOSIFICADORAS DE PISTÓN

Le sugerimos leer con atención las instrucciones antes de instalar y poner en marcha la bomba.
Las informaciones de este manual pueden ser modificadas sin previo aviso y no son vinculantes

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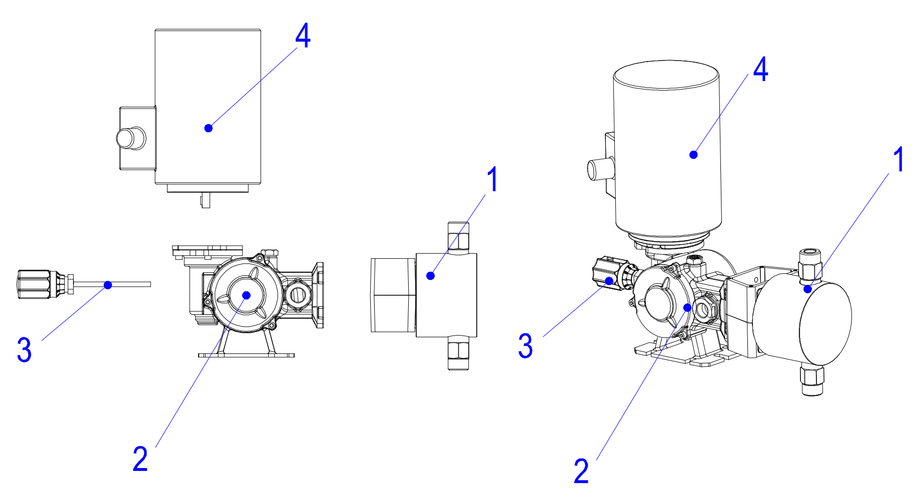
1. DESCRIPCIÓN



1	Testata	Cabeza	Pump head	Tête	Pumpenkopf
2	Meccanismo	Mecanismo	Mechanism	Mecanisme	Triebwerk
3	Regolazione	Regulaciòn	Adjustment	Régulation	Hubeinstellung
4	Motore	Motor	Motor	Moteur	Motor

La bomba dosificadora es una bomba volumétrica alternativa, cuyos componentes principales son: motor (generalmente eléctrico), reductor, mecanismo, dispositivo de regulación de la carrera, cabezal de bombeo.

⇨ **La bomba dosificadora se fabrica respetando las normas italianas de seguridad y prevención.**

Instrucciones para la seguridad

ATENCIÓN

Procure no superar la presión máxima admitida
(por ejemplo instalando una válvula de seguridad)

Antes de empezar a trabajar en la bomba, realice los siguientes controles:

- el motor eléctrico debe estar desconectado de la red de alimentación;
- no debe haber presión en el cabezal ni en las tuberías;
- las piezas en contacto con líquidos agresivos o peligrosos deben haber sido lavadas perfectamente antes de ser tocadas;
- los operadores deben usar los equipos de protección individual previstos por las leyes vigentes.

1.1 Aplicaciones

La bomba dosificadora es un componente de proceso capaz de transferir una cantidad definida de líquido con elevada precisión; también es posible modificar el caudal, utilizando un dispositivo específico.
Para obtener las mejores prestaciones, la bomba debe ser seleccionada teniendo en cuenta las prestaciones requeridas y la compatibilidad de los materiales de fabricación de las piezas en contacto con el líquido.

Antes de usar la bomba para un uso diferente de aquel previsto, le sugerimos pedir informaciones a nuestro Departamento Técnico.

1.2 Placa de características

Medidas reales: mm 65x35

1
Item
N.F. 2
L/h 3 bar 4
C E

1	Modello	Modelo	Model	Modèle	Modell Triebwerks
2	Numero di fabbrica	Número de matrícula	Serial Number	Numéro de fabrication	Baunummer
3	Portata	Caudal	Flow rate	Débit	Förderleistung
4	Pressione massima	Presión máxima	Maximum pressure	Maximum pressure	Maximaler Druck
5	Riferimenti	Referencias	Reference	Références	Bezugdaten

1.3 Mecanismo y reductor

El mecanismo es el dispositivo que permite transformar el movimiento giratorio del motor eléctrico en alternativo y accionar el pistón.

1.3.1 Regulación de la carrera

Para obtener la mejor precisión, la bomba debe trabajar en condiciones ideales tales como velocidad, presión, viscosidad constantes.

Modelos

Para modificar desde 0 al 100% el caudal máximo, gire el regulador hacia la izquierda; cada vuelta del regulador corresponde a una variación de 1/10 del caudal máximo; además, el regulador está subdividido en 10 partes, y cada una de dichas partes corresponde a 1/100 del caudal máximo.

1.4 Cabezal

1.4.1 Principio de funcionamiento

El cierre mecánico (5) en el pistón (4) aísla el cabezal de la atmósfera.

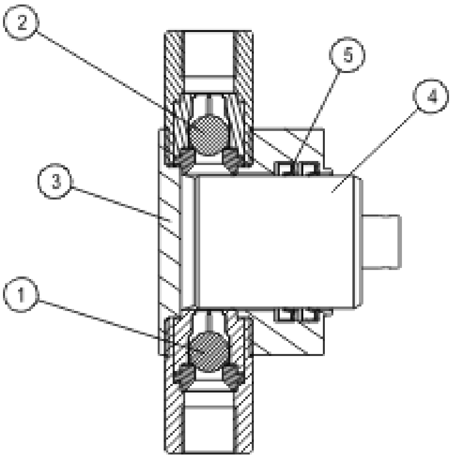
Las válvulas de aspiración (1) y de descarga (2) son accionadas por el alternarse de la presión positiva y negativa.

Aspiración

Durante la carrera de aspiración (pistón retrocediente) la diferencia entre la presión de aspiración y la presión en el interior del cabezal (3) provoca la apertura de la válvula de aspiración (1).
El líquido de proceso es aspirado por la tubería de aspiración en el interior del cabezal (3).

Descarga

Durante la carrera de descarga (pistón avanzando) la válvula de aspiración (1) está cerrada y la válvula de descarga (2) se abre por efecto de la presión en el interior del cabezal (3). El líquido de proceso es bombeado por el cabezal (3) en la tubería de descarga.



1	Valvola di aspirazione	Válvula de aspiracón	Suction valve	Vanne d’aspira	
2	Valvola di scarico	Válvula de impulsión	Discharge valve	Vanne de refoulement	Auslaßventil
3	Testata	Cabeza	Pump head	Tête	Prozeßkammer
4	Pistone	Pistón	Plunger	Piston	Kolben
6	Tenuta	Junta	Packing	Garniture	Kolbendichtung

1.4.2 Cierre mecánico

Las bombas de pistón es equipadas con cierres mecánicos constituido de anillos de reborde en elastómero y no requieren ninguna regulación.

2. *INSTALACIÓN*

2.1 Precauciones de seguridad

Para minimizar los riesgos de accidentes durante la instalación, siga las instrucciones del párrafo 6.1 y además:

- no trabaje solo;
- instale un telerruptor con protección térmica;
- conecte la puesta a tierra del motor;
- al trabajar sobre la bomba, controle que el motor eléctrico o el servomotor no estén conectados a la red;
- utilizando herramientas eléctricas en zonas peligrosas, respete las normas específicas;
- tenga a mano un botiquín de primeros auxilios;
- respete las leyes locales de seguridad.

Instalación

- La altura de instalación debe permitir realizar los trabajos de mantenimiento, el desplazamiento, la descarga y la reposición de lubricante y el desmontaje del cabezal.
- Instale la bomba **sin tensiones** en la base y en las conexiones del cabezal.
- Instale la bomba con el eje del pistón horizontal y el eje de las válvulas vertical.

Conexiones eléctricas

PELIGRO

Los motores y componentes eléctricos deben estar conectados de conformidad con las leyes locales y deberán ser conectados por personal cualificado.

Instale una protección contra la sobrecarga o un sensor de temperatura.
Compruebe la tensión, la frecuencia, la velocidad del motor y la potencia.
En zonas peligrosas, observe las disposiciones y leyes específicas.

2.2 Generalidades

Para un buen funcionamiento es fundamental que la bomba esté bien instalada:

- Antes de realizar las conexiones hidráulicas, controle que el interior de las tuberías, depósitos, etc. estén bien limpios; se aconseja instalar, cerca de la boca de aspiración, un filtro provisional que retenga los residuos y escorias de la instalación.
- Conecte las tuberías procurando no poner bajo tensión las bocas de la bomba.
- Instale tuberías de sección adecuada para el caudal máximo de la bomba; evite estrangulamientos o recorridos tortuosos donde podrían formarse burbujas de aire o de gas.

- Antes y después del cabezal, instale una válvula de interceptación y una unión en cruz, que permitirá poder desmontar la bomba sin vaciar la instalación e instalar posibles accesorios, tales como manómetros, depósitos, etc.
- Monte juntas de dilatación cuando se bombean líquidos a alta temperatura.
- En el caso de cabezales de plástico, instale uniones flexibles tanto en la aspiración como en la impulsión.

Las bombas de accionamiento hidráulico pueden funcionar con un NPSH de hasta 70 Kpa ass. equivalentes a 7 m.c.a. (NPSH = Net Positive Suction Head); sin embargo, para mejorar la precisión de dosificación y acelerar el cebado, es preferible la instalación bajo una ligera presión de agua.

ATENCIÓN

Para prevenir averías serias, las tuberías de aspiración y de descarga deben estar diseñadas, dimensionadas y conectadas a la bomba correctamente.

2.3 Tubería de aspiración (véase la tabla de las sugerencias para la instalació

- Establezca la tubería más corta posible (fig. 1) y evite recorridos sinuosos (fig. 2).
- La tubería debe ser dimensionada teniendo en cuenta que la relación entre el caudal instantáneo máximo y el caudal medio es 3,14 para bombas símplex (Fig. D, pág. 9), 1,5 para bombas dúplex (con pistones desbalanceados 180°), 1,05 para bombas tríplex (con pistones desbalanceados 120°).
- Indicativamente, la tubería instalada debería tener un diámetro igual a 1,5 el diámetro de las bocas de la bomba.
- Para su información, la velocidad aconsejada en las tuberías debería ser 0,5÷0,8 m/seg. con líquidos con viscosidad similar al agua y un peso específico de hasta 1200 Kg/m^3.
- Instale un filtro de aspiración permanente; el filtro debe tener un cartucho filtrante de 150 μm y una pérdida de carga inferior a 0,2 m.c.a. (calculados considerando los coeficientes citados). Al filtro debe ser fácil de acceder y debe ser controlado y lavado periódicamente.
- En el caso de tuberías largas, para impedir problemas de cavitación, instale cerca de la bomba un depósito de expansión o un depósito (fig. 3).
- No conecte la bomba al fondo del depósito (fig. 4) para evitar que aspire impurezas.
- La aspiración desde un depósito bajo vacío se puede obtener conectando las tuberías tal como se muestra en la fig. 5. Abra la válvula 2 y compruebe el llenado a través de la mirilla 3, cierre la válvula 2, ponga en marcha la bomba; la válvula antirretorno 4 impide que el líquido retorne con la bomba detenida.

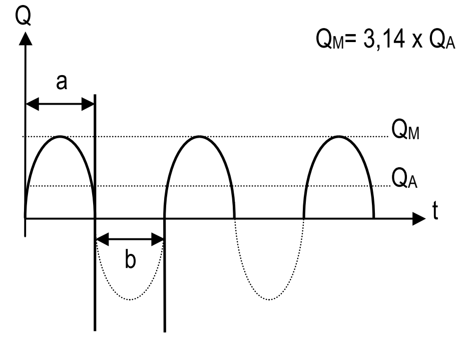


Fig. D

Q	Portata	Caudal	Flow rate	Débit	Förderleistung
Q_A	Portata media	Caudal promedio	Medium Flow rate	Débit moyen	Duchschnittliche
Q_M	Portatamassima	Caudal máximo	Maximum flow rate	Débit maximale	Max. Durchflussmenge
a	Corsa di scarico	Carrera de impulsión	Discharge stroke	Course de refoulement	Auslaßhub
b	Corsa di aspirazione	Carrera de aspiración	Suction stroke	Course d’aspiration	Ansaughub
t	Tempo	Tiempo	Time	Temps	Zeit

2.4 Tubería de impulsión (véase la tabla de las sugerencias para la instalación)

- Controle que entre la impulsión y la aspiración haya una diferencia positiva de presión de 50÷100 Kpa como mínimo; si las condiciones de la instalación no permiten una diferencia positiva, dicho valor se puede obtener instalando una válvula de contrapresión (fig. 6), o bajando el depósito de aspiración (fig. 7), o levantando la tubería de impulsión (fig. 8).
- Por motivos de seguridad, es obligatorio instalar una válvula de seguridad para prevenir averías por sobrepresiones imprevistas; la descarga de la válvula de seguridad debería ser visible y estar conectada al depósito o a un desagüe. Se desaconseja conectar la descarga a la aspiración de la bomba (fig. 9).
- Si se instala una válvula de contrapresión, instale la válvula de seguridad tal como indicado en la fig. 10.
- Se aconseja instalar los manómetros con la escala del 20% superior a la presión de ajuste de la válvula de seguridad.
- Para disminuir las pulsaciones, se aconseja instalar un depósito de compensación en proximidad de la válvula de impulsión de la bomba.

Los depósitos más usados son:

- depósitos en contacto directo entre líquido de proceso y colchón de aire (cámara de aire); son sencillos pero requieren controles periódicos y restablecimientos del colchón de aire.

- depósitos de membrana o bolsa que separan el colchón de aire/gas del líquido de proceso; la presión de precarga generalmente es igual al 60÷75% de la presión máxima de servicio para instalación en la impulsión.

Los depósitos deben ser controlados periódicamente para comprobar la integridad de la membrana/bolsa y la

presión correcta de precarga; los depósitos se deben seleccionar teniendo en cuen ca de los materiales de las piezas en contacto.
Si se instala una válvula de contrapresión, monte el depósito tal como se muestra en la Fig. 11.

A) en el caso de baja presión; para un funcionamiento correcto, la presión de precarga del depósito debe ser superior a la presión de ajuste de la válvula de contrapresión;

B) en el caso de alta presión.

Para mayores informaciones sobre la instalación y sobre el dimensionamiento de los depósitos, tenga a bien contactar a nuestro Departamento Técnico.

Se aconseja instalar una válvula antirretorno si la impulsión de la bomba está conectada a una tubería bajo presión.

⇨ Durante la instalación de la bomba y de los accesorios, se aconseja prever las válvulas de interceptación para facilitar el mantenimiento; la Fig. 13 muestra una instalación típica.
⇨ Siga estas instrucciones cuando se deban bombear líquidos que tienden a cristalizarse o suspensiones que tienden a sedimentarse:

- para prevenir la sedimentación, mantenga la suspensión bien agitada;
- no instale tuberías verticales encima de la boca de impulsión;
- antes de detener la bomba, realice un ciclo de lavado de la bomba y de las tuberías;
- las tuberías de aspiración y de descarga deben prever el desagüe completo.

3. PUESTA EN MARCHA

Conexiones eléctricas:

- conecte el motor eléctrico a la red;
- controle el sentido de rotación; una flecha en el motor indica el sentido de rotación correcto.

El motor eléctrico debe ser conectado sólo por personal cualificado!

ATENCIÓN
No ponga en marcha la bomba con las válvulas de aspiración y de impulsión cerradas.
No cierre las válvulas con la bomba en funcionamiento.

Antes de poner en marcha la bomba, controle los siguientes puntos:

- Controle el nivel del aceite del mecanismo.
- Controle el nivel del líquido hidráulico del cabezal.
- Compruebe que la bomba esté protegida contra sobrepresiones (instalación de la válvula de seguridad).
- Compruebe que todas las conexiones hidráulicas estén bien apretadas.
- Coloque el regulador en "cero", véase el párrafo 1.3.1.
- Ponga en marcha la bomba sin presión de descarga y aumente progresivamente el caudal hasta llegar al 100%.
- Compruebe que el líquido en la cámara hidráulica no tenga burbujas de aire; oprima la válvula de purga hasta que salga todo el aire.
- Deje funcionar la bomba durante algunos minutos.

Aumente progresivamente la presión hasta llegar a las prestaciones deseadas.

ATENCIÓN
NO SUPERE LAS PRESTACIONES MÁXIMAS IMPRESAS EN LA PLACA DE LA BOMBA
Si en la instalación no hubiera un manómetro, se aconseja instalar un manómetro no permanente para controlar que la presión efectiva en el momento del arranque no supere la presión máxima admitida.

Las bombas son autocebantes; sin embargo, se podrían producir algunos problemas de cebado en bombas de bajo caudal, pistones de diámetro pequeño, o con válvulas de contrapresión incorporadas. En dichos casos, podría ser necesario favorecer el cebado de la bomba, purgando el aire del cabezal y de la tubería de aspiración.

ATENCIÓN
Si el líquido bombeado es tóxico, venenoso, agresivo, inflamable o peligroso, tenga mucho cuidado, evitando fugas accidentales a través de las juntas o de las tuberías durante la puesta en marcha o los trabajos de mantenimiento.
Durante el desplazamiento o la eliminación de las substancias peligrosas, siga todas las instrucciones del proveedor y las leyes de seguridad locales.

4. MANTENIMIENTO

4.1 Precauciones

- Antes de trabajar en la bomba, controle que todas las conexiones eléctricas (de potencia y de control) estén desconectadas de la red y que no estén más alimentadas.
- Despresurice la bomba y la tubería, desagüe la sección en la que deba realizar el mantenimiento.
- Siempre póngase los elementos de protección requeridos.
- No derrame en el medio ambiente substancias contaminantes tales como productos químicos, aceite lubricante, etc.
- Antes de realizar el mantenimiento de la bomba o de la instalación, lea con atención las especificaciones técnicas del líquido bombeado, especialmente las medidas que hay que tomar en el caso de contacto accidental con fluidos peligrosos.

4.2 Mecanismo

Las bombas se entregan generalmente con el primer suministro de aceite que deberá cambiarse transcurridas 1500 horas de funcionamiento y luego cada 4000 horas.
De todas maneras, cambie el aceite todos los años.
Use los aceites aconsejados en la tabla antedicha o aceites equivalentes.

Semanalmente, controle el nivel de aceite y, si fuera necesario, restablézcalo utilizando el mismo tipo de aceite; también controle que no haya fugas a través del cierre mecánico del vástago del pistón y, si fuera necesario, sustituya el anillo de reborde.

AGIP	BP	ESSO	IP	MOBIL	SHELL
BLASIA 150	ENERGOL GR-XP150	SPARTAN EP 150	MELLANA OIL 150	MOBIL GEAR 629	OMALA OIL 150

4.3 Cabezal

No haga funcionar la bomba sin líquido.

Cada seis meses desmonte el cabezal como indicado a continuación:

- desconecte las tuberías de aspiración y de impulsión;
- descargue el líquido de proceso del cabezal y de las tuberías;
- desenrosque los tornillos que fijan el cabezal al mecanismo;
- desmonte las válvulas de aspiración y de impulsión;

y efectúe las siguientes operaciones:

- lave perfectamente las válvulas de aspiración y de descarga y controle que no haya piezas gastadas o rayada; si así fuera, sustituya la pieza en malas condiciones;
- sustituya los anillos del cierre mecánico si estuvieran gastados; antes de montar los anillos nuevos, aplíqueles un poco de grasa.
- controle la zona de deslizamiento del cierre mecánico sobre el pistón, la superficie no debe estar ni rayada ni con estrías; sustituya el pistón si estuviera averiado.

4.4 Recambios aconsejados

Para poder realizar el mantenimiento sin perder tiempo, se aconseja tener en almacén los siguientes recambios:

- Un pistón
- Dos series de cierres mecánicos del pistón
- Una válvula de aspiración completa
- Una válvula de impulsión completa
- Una serie de juntas del mecanismo

Cuando deba pedir recambios, le rogamos indicar siempre el modelo y el número de fabricación de la bomba.

5. BÚSQUEDA DE LAS AVERÍAS

Avería	Posibles causas	Soluciones
Caudal bajo o inexistente	Depósito sellado sin purgador	Instale un purgador o abra la tapa del depósito
	Aspiración de aire a través de las uniones, juntas, etc.	Apriete las conexiones
	Burbujas de aire o de gas en la bomba o en las tuberías	Agilice la salida del aire
	Filtro o tubería de aspiración atascados	Lave el filtro o elimine la obstrucción
	Válvulas de interceptación cerradas	Abra las válvulas
	Altura de aspiración excesiva	Coloque la bomba en la altura correcta
	Tensión de vapor y/o temperatura del líquido muy elevadas	Enfríe el líquido
	Viscosidad muy elevada, temperatura del líquido muy baja	Caliente el líquido
	Válvulas de la bomba sucias o gastadas	Lave o sustituya las válvulas
	Carreras/min. inferior al nominal	Controle la velocidad y la alimentación eléctrica
	Diámetro de la tubería de aspiración muy pequeño	Controle la longitud y el diámetro de la tubería
	Válvula de seguridad ajustada en un valor inferior a la presión máxima de impulsión	Controle el ajuste de la válvula y la presión de servicio efectiva
	Longitud de la carrera incorrecta	Controle y regule según las necesidades
	Fuga excesiva a través del cierre mecánico	Comprima el cierre mecánico, controle el desgaste del pistón y del cierre mecánico, sustituya las piezas gastadas
	Válvula de seguridad en funcionamiento, fugas a través de la válvula	Controle el ajuste correcto o limpie la válvula
Caudal elevado	Presión de impulsión inferior a la presión de aspiración	Instale una válvula de contrapresión
	Longitud de la carrera incorrecta	Controle y regule según las necesidades
	Válvula de contrapresión averiada o mal ajustada	Modifique el ajuste o sustituya la válvula
	Carreras/min. superior al nominal	Controle la velocidad y la alimentación eléctrica
Recalentamiento del motor eléctrico	Presión de impulsión muy elevada	Controle el ajuste de la válvula de seguridad
	Tubería de impulsión mal dimensionada	Controle la longitud y el diámetro de la tubería
	Conexiones eléctricas incorrectas	Controle y corrija las conexiones
Funcionamiento ruidoso	Falta lubricante en el mecanismo o en el reductor	Rellene con lubricante idóneo
	Desgaste excesivo del mecanismo o del reductor	Revise el mecanismo o el reductor
Vibraciones en las tuberías	Diámetro de las tuberías muy pequeño	Aumente el diámetro de las tuberías
	Depósito de compensación muy pequeño o fuera de servicio	Repare o calcule de nuevo el volumen del depósito

6. *DESPLAZAMIENTO Y ALMACENAMIENTO*

6.1 Desplazamiento

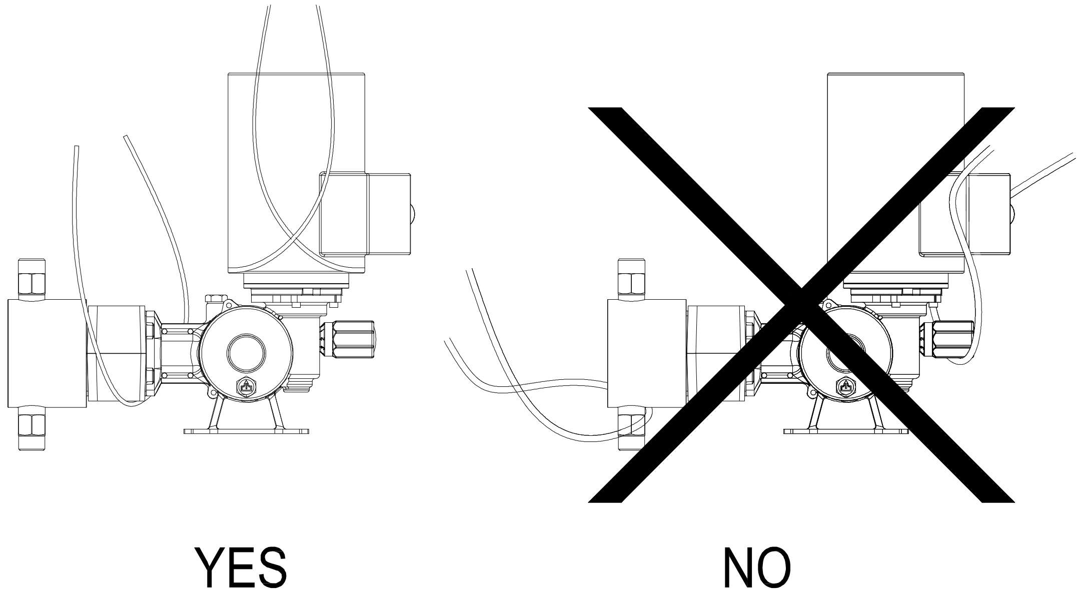
La figura de abajo muestra el modo correcto para desplazar la bomba.
Si la bomba está montada sobre una base con armellas de elevación, utilice estas últimas para el desplazamiento.

⇨ **siempre respete las siguientes instrucciones:**

- **no eslingue, tire o empuje** de las bridas o de las bocas del cabezal
- **no eslingue, tire o empuje** del cuerpo de la válvula de seguridad
- **no eslingue, tire o empuje** del regulador
- **no eslingue, tire o empuje** del pistón

⇨ **al levantar cargas, observe lo siguiente**

- póngase un casco, guantes y zapatos de protección;
- no se pare ni pase por abajo de las cargas suspendidas;
- no levante manualmente cargas pesadas;
- al levantar manualmente cargas, no asuma posiciones que podrían ser perjudiciales para su columna vertebral o para los músculos dorsales.



6.2 Almacenamiento y conservación

ATENCIÓN

Durante el transporte y el almacenamiento la bomba siempre debe estar protegida contra la humedad, agua salada, lluvia, polvo, arena y rayos directos del sol.

Si hubiera que almacenar la bomba durante un período prolongado de tiempo, siga estas instrucciones:

A. Almacenamiento en un lugar seco y ventilado

La bomba puede almacenarse durante un año sin tomar medias de precaución particulares.

B. Almacenamiento en un lugar muy húmedo

La bomba debe protegerse herméticamente de la condensación, utilizando una cantidad adecuada de sales de gel de sílice; en dichas condiciones se puede almacenar durante un año.

C. Almacenamiento al aire libre

Además de las recomendaciones del punto B, hay que protegerla contra la lluvia, arena, polvo, impurezas y rayos directos del sol.

D. Precauciones a tomar después de la instalación de una bomba

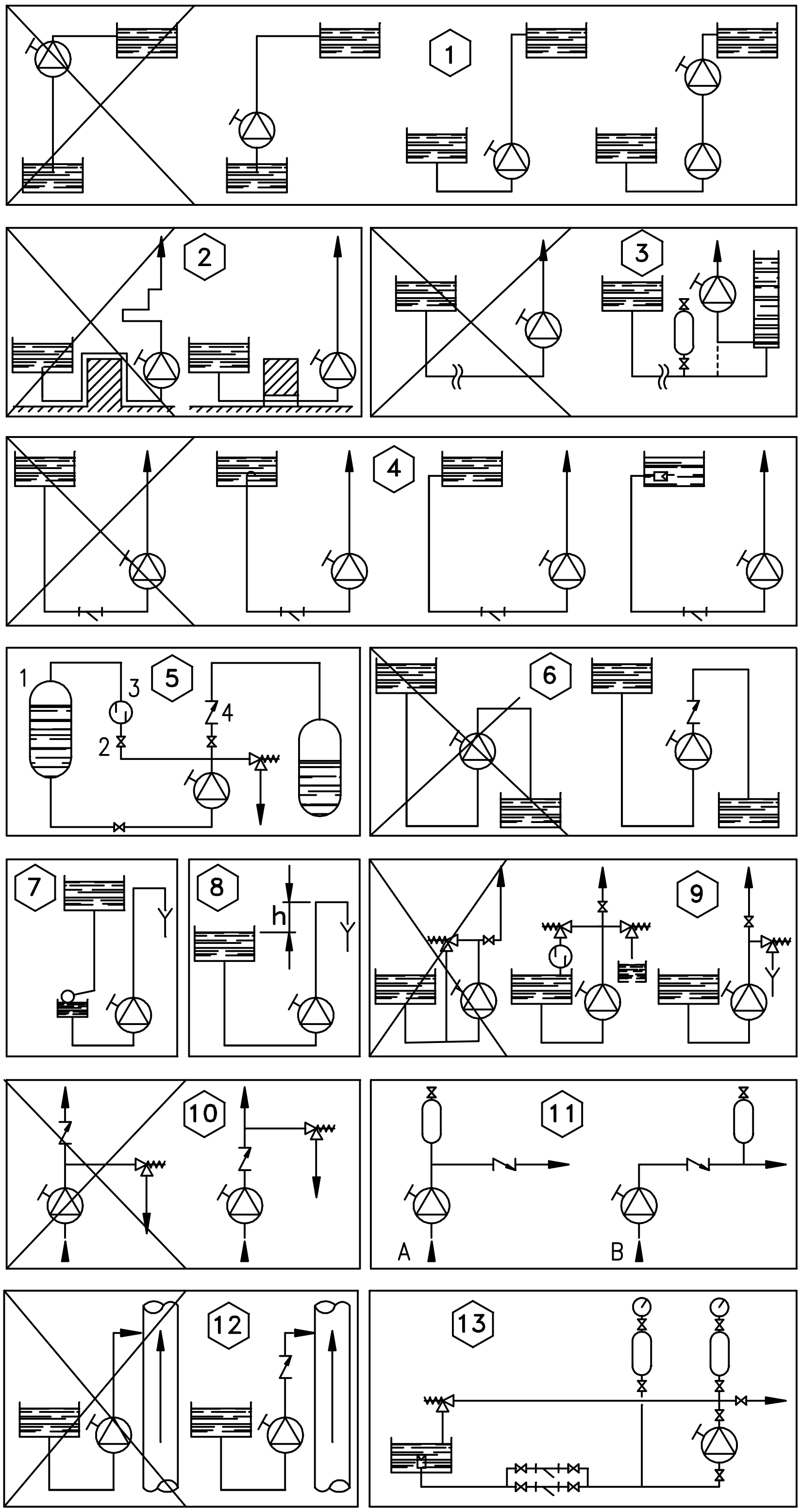
Antes de la puesta en marcha, controle que el mecanismo y la cámara hidráulica estén bien llenos.
Si se pospone la puesta en servicio de la bomba, acciónela durante una hora todos los meses con el regulador en "cero", véase el párrafo 1.3.1.

Cambie el lubricante todos los años.

Cambie nuevamente el lubricante del mecanismo antes de la puesta en funcionamiento efectiva de la bomba.
Si después de la instalación la bomba debe permanecer inactiva durante mucho tiempo, tome estas medidas de precaución:

- desmonte completamente el cabezal y lave perfectamente todas las piezas;
- desmonte, limpie y engrase el cierre mecánico; reinstale sin comprimir el prensaestopas;
- engrase todas las superficies mecanizadas;
- vierta lubricante de protección en el mecanismo y en el reductor y accione la bomba durante algunos minutos;
- en el momento de la puesta en marcha, descargue el lubricante de protección y llene con el lubricante adecuado;
- guarde la bomba en un lugar seco y protegida del polvo.

Tabla de sugerencias para la instalación



SERBATOIO TANK TANK	DEPÓSITO RESERVOIR
POMPA DOSATRICE DOSING PUMP DOSIERPUMPE	BOMBA DOSIFICADORA POMPE DOSEUSE
POMPA AUSILIARIA BOOSTER PUMP HILFSPUMPE	BOMBA AUXILIARA POMPE AUXILIAIRE
POLMONE SMORZATORE PULSATION DAMPER PULSATIONDÄMPFER	DEPÓSITO DE COMPENSACIÓN POUMON AMORTISSEUR
VALVOLA ON-OFF VALVE VENTIL	VÁLVULA VANNE
SERBATOIO IN PRESSIONE PRESSURIZED TANK TANK UNTER DRUCK	DEPÓSITO EN PRESIÓN RESERVOIR PRESSUR
FILTRO A “Y” “Y” FILTER “Y” FILTER	FILTRO DE “y” FILTRE A “Y”
SPIA WINDOW SCHAULGLAS	MIRILLA TEMOIN
VALVOLA DI CONTROPRESSIONE CHECK VALVE GEGENDRUCKVENTIL	VÁLVULA DE CONTRAPRESIÓN VANNE DE CONTREPRESSION
VALVOLA DI SICUREZZA PRESS RELIEF VALVE SICHERHEITSVENTIL	VÁLVULA DE SEGURIDAD VANNE DE SECURITE
VALVOLA A GALLEGGIANTE FLOAT-OPERATED VALVE SCHWIMMERVENTIL	VÁLVULA FLOTANTE VANNE A FLOTTEUR
MANOMETRO PRESSURE GAUGE MANOMETER	MANÓMETRO MANOMETRE

Manuel d'emploi, entretien et installation

POMPES DOSEUSES A PISTON

Nous vous suggérons de lire attentivement les instructions avant d'installer et démarrer la pompe.
Les informations de ce manuel peuvent être modifiées sans aucun avis préalable et ne constituent pas de contrainte.

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1.2 Plaquette d'identification
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2 INSTALLATION
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5 IDENTIFICATION PANNES

6 MANUTENTION ET STOCKAGE
6.1 Manutention
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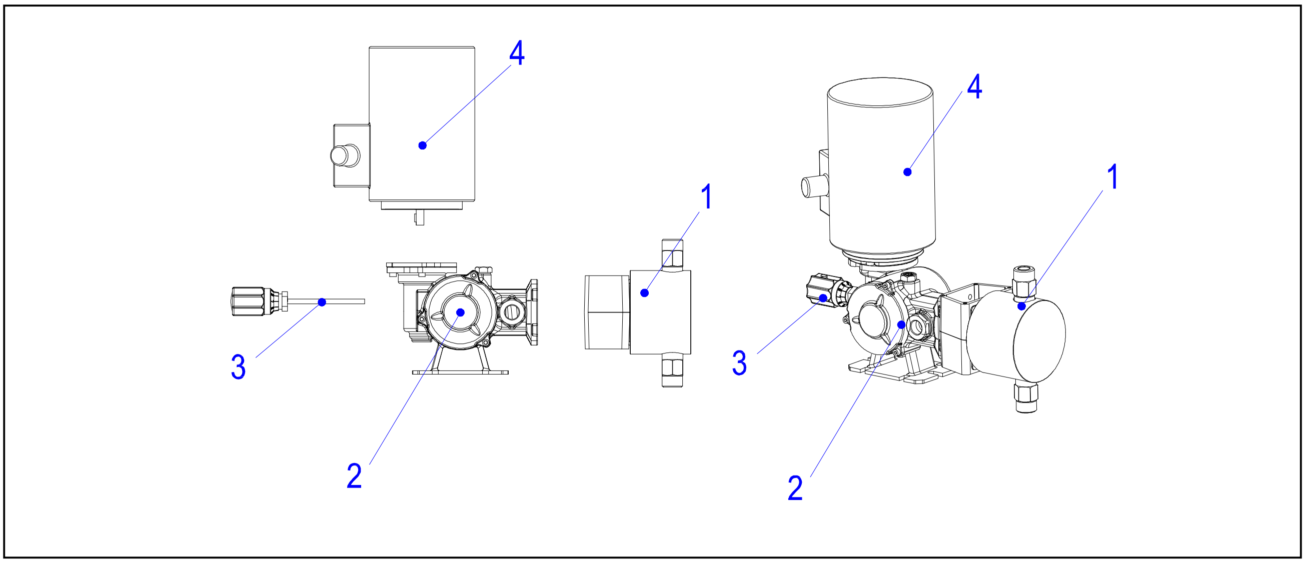
Tableau suggestions pour l'installation

1. DESCRIPTION



1	Testata	Cabeza	Pump head	Tête	Pumpenkopf
2	Meccanismo	Mecanismo	Mechanism	Mecanisme	Triebwerk
3	Regolazione	Regulaciòn	Adjustment	Régulation	Hubeinstellung
4	Motore	Motor	Motor	Moteur	Motor

La pompe doseuse est une pompe volumétrique, alternative dont les composants principaux sont: moteur (généralement électrique), réducteur, mécanisme, dispositif de réglage de la course, tête de pompage.

⇨ **La pompe doseuse est construite en conformité avec les réglementations italiennes pour la sécurité et la prévention.**

INSTRUCTIONS POUR LA SECURITE

ATTENTION

Eviter de dépasser la pression maximum admise
(par exemple en installant une vanne de sécurité)

Avant de commencer à travailler sur la pompe vérifier attentivement ce qui suit:

- que le moteur électrique est débranché du réseau d'alimentation
- que la pression a été déchargée de la tête et des tubes
- que les parties en contact avec des liquides agressifs et/ou dangereux ont été soigneusement lavées avant d'être maniées
- que les opérateurs portent les moyens de protection personnelle prévus par les lois en vigueur

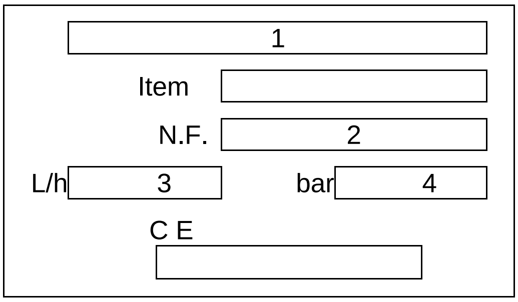
1.1 Applications

La pompe doseuse est un composant de processus apte à transférer déterminées quantités de liquide avec une précision élevée; en plus il est possible de changer le débit en agissant sur un dispositif spécial.
Pour obtenir les meilleures performances, la pompe doit être sélectionnée en considérant les performances requises et la compatibilité des matériaux de construction des parties en contact avec le liquide.

Avant d'utiliser une pompe pour un emploi différent de celui d'origine, nous vous suggérons de demander des renseignements à notre Bureau Technique.

1.2 Plaquette d’identification

Dimensions réelles: mm 65x35



1	Modello	Modelo	Model	Modèle	Modell Triebwerks
2	Numero di fabbrica	Número de matrícula	Serial Number	Numéro de fabrication	Baunummer
3	Portata	Caudal	Flow rate	Débit	Förderleistung
4	Pressione massima	Presión máxima	Maximum pressure	Maximum pressure	Maximaler Druck
5	Riferimenti	Referencias	Reference	Références	Bezugdaten

1.3 Mécanisme et réducteur

Le mécanisme est le dispositif qui permet de transformer le mouvement rotatoire du moteur électrique en alternatif et d’actionner le piston.

1.3.1 Réglage de la course

Pour obtenir la précision optimale, la pompe doit opérer en des conditions idéales: telles que vitesse, pression, viscosité constantes.

Modèles

La variation de 0 à 100% du débit maximum est obtenue en tournant la poignée de réglage dans le sens contraire à celui des aiguilles de la montre; à chaque tour de la poignée correspond une variation de 1/10 du débit maximum ; de plus la poignée est divisée en 10 parties correspondant chacune à 1/100 du débit maximum.

1.4 Tête

1.4.1 Principe de fonctionnement

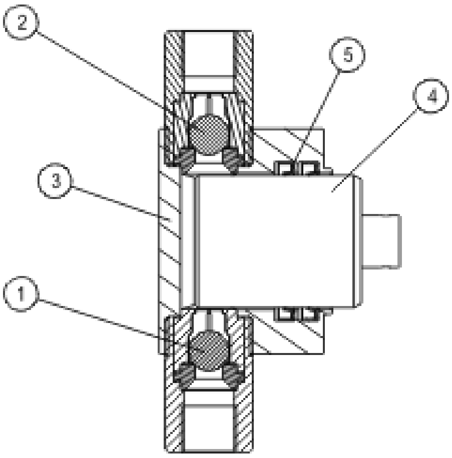
L’étanchéité (5) sur le piston (4) isole la tête de l’atmosphère; les vannes d’aspiration (1) et refoulement (2) sont actionnées par l’alternance de pression positive et négative.

Aspiration

Pendant la course d’aspiration (piston rétrocédant) la différence entre la pression d’aspiration et la pression à l’intérieur de la tête (3) provoque l’ouverture de la vanne d’aspiration (1).
Le liquide de processus est aspiré par la ligne d’aspiration à l’intérieur de la tête (3).

Refoulement

Pendant la course de déchargement (piston avançant) la vanne d’aspiration (1) est fermée et la vanne de refoulement (2) s’ouvre par effet de la pression à l’intérieur de la tête (3). Le liquide de processus est pompé par la tête (3) dans la ligne de refoulement.



1	Valvola di aspirazione	Válvula de aspiracón	Suction valve	Vanne d’aspira	
2	Valvola di scarico	Válvula de impulsión	Discharge valve	Vanne de refoulement	Auslaßventil
3	Testata	Cabeza	Pump head	Tête	Prozeßkammer
4	Pistone	Pistón	Plunger	Piston	Kolben
6	Tenuta	Junta	Packing	Garniture	Kolbendichtung

1.4.2 Etanchéité

Les pompes à piston peuvent être équipées avec d’étanchéité composée d’anneaux à lèvre en élastomère et ne nécessitent d’aucun réglage.

2. *INSTALLATION*

2.1 Précautions de sécurité

Pour minimiser les risques d’accident pendant l’installation, suivre les instructions du paragraphe 6.1 et en plus:

- ne travaillez pas tout seuls
- installer un télérupteur avec protection thermique
- brancher la mise à la terre du moteur
- en travaillant sur la pompe vérifier que le moteur électrique ou le servomoteur ne sont pas connectés au réseau
- utilisant des outils électriques dans des zones dangereuses, respecter les règlements spécifiques
- garder à portée de main une trousse pour les premiers soins
- respecter les lois locales pour la sécurité

Installation

- La hauteur d’installation doit être de nature à faciliter les opérations d’entretien, la manutention, la vidange et le remplissage de lubrifiant, le démontage de la tête
- Installer une pompe **sans tensions** sur le châssis et sur les connexions de la tête
- Installer une pompe avec l’axe du piston horizontal et l’axe des vannes verticales

Connexions électriques

DANGER

Les moteurs et les composants électriques doivent être connectés en conformité avec les lois locales et seulement par du personnel qualifié.

Installer une protection contre la surcharge ou un capteur de température.
Vérifier le voltage, la fréquence, la vitesse du moteur et la puissance.
Dans des zones dangereuses respectez les dispositions/lois spécifiques

2.2 Généralités

Pour le bon fonctionnement il est fondamental que la pompe soit correctement installée:

- Avant d’effectuer les connexions hydrauliques vérifier que l’intérieur des tuyaux, réservoirs, etc. ont été soigneusement nettoyés; de toute façon on conseille d’installer, proche du goulot d’aspiration, un filtre temporaire qui collecte les résidus et les scories du système.
- Connecter les tuyaux en évitant de mettre en tension les goulots de la pompe
- Installer des tuyaux de section appropriée pour le débit maximum de la pompe, éviter étranglements ou parcours tortueux où pourraient se former des poches d’air ou gaz.
- Installer avant et après la tête, une vanne d’interception et un joint cruciforme, ceci permettra de démonter la pompe sans vider le système et d’installer d’éventuels accessoires tels que manomètres, réservoirs, etc.
- Insérer des joints de dilatation quand on pompe des liquides à température élevée
- Dans le cas de têtes en matière plastique, installer des joints flexibles aussi bien en aspiration qu’en refoulement.
  Les pompes à commande hydraulique peuvent fonctionner avec un NPSH jusqu’à 70 Kpa ass. équivalent à 7 m.c.a.. (NPSH = Net Positive Suction Head), toutefois afin d’améliorer la précision de dosage et d’accélérer l’amorçage, l’installation légèrement en charge est préférable

ATTENTION

Pour prévenir des dommages sérieux les lignes d’aspiration et de refoulement doivent être correctement conçues, dimensionnées et connectées à la pompe

2.3 Ligne d’aspiration (voir tableau suggestions pour l’installation)

- Prévoir les tuyaux les plus courts possibles (fig. 1), éviter des parcours tortueux (fig. 2)
- Les tuyaux doivent être dimensionnés en considérant que le rapport entre le débit maximum instantané et le débit moyen est 3,14 pour pompes simplex (Fig. D page 9), 1,5 pour pompes duplex (avec pistons décalés de 180°), 1,05 pour pompes triplex (avec pistons décalés de 120°).
- A titre d’indication les tuyaux installés devraient avoir un diamètre égal à 1,5 le diamètre des goulots de la pompe.
- Pour votre information la vitesse conseillée dans les tuyaux devrait être de 0,5÷0,8 m/sec avec liquides ayant une viscosité semblable à l’eau et poids spécifique jusqu’à 1200 Kg/m3.
- Installer un filtre d’aspiration permanent; le filtre doit avoir une cartouche filtrante de 150 μm et une perte de charge inférieure 0.2 m.c.a. (calculés en considérant les coefficients susmentionnés). Le filtre doit être facilement accessible et périodiquement contrôlé/lavé.
- En cas de tuyaux longs, pour éviter des problèmes de cavitation, installer proche de la pompe un vase d’expansion ou un réservoir (fig. 3) .
- Ne pas relier la pompe au fond du réservoir (fig. 4) pour éviter l’aspiration d’impuretés.
- L’aspiration d’un réservoir sous vide peut être obtenue en reliant les tuyaux comme illustré dans la fig. 5. Ouvrir la vanne 2 et vérifier le remplissage à travers le voyant 3, fermer la vanne 2, démarrer la pompe; le clapet de non-retour 4 empêche le reflux du liquide à pompe arrêtée

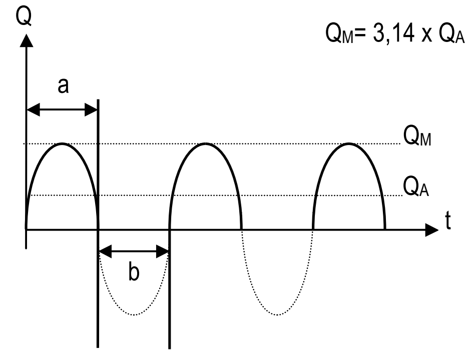


Fig. D

Q	Portata	Caudal	Flow rate	Débit	Förderleistung
Q_A	Portata media	Caudal promedio	Medium Flow rate	Débit moyen	Duchschnittliche
Q_M	Portatamassima	Caudal máximo	Maximum flow rate	Débit maximale	Max. Durchflussmenge
a	Corsa di scarico	Carrera de impulsión	Discharge stroke	Course de refoulement	Auslaßhub
b	Corsa di aspirazione	Carrera de aspiración	Suction stroke	Course d’aspiration	Ansaughub
t	Tempo	Tiempo	Time	Temps	Zeit

2.4 Ligne de refoulement (voir tableau conseils pour l’installation, page 14)

- Vérifier qu’entre refoulement et aspiration il existe une différence positive de pression d’au moins 50÷100 Kpa; si les conditions du système ne permettent pas une différence positive, on peut atteindre ce but en installant une vanne de contrepression (fig. 6) ou baissant le réservoir d’aspiration (fig. 7) ou soulevant la ligne de refoulement (fig. 8).
- Pour des raisons de sécurité il est obligatoire d’installer une vanne de sécurité afin de prévenir des dommages suite à des surpressions imprévues; la vidange de la vanne de sécurité devrait être visible et reliée au réservoir ou à un drainage. Il n’est pas recommandé de relier la vidange à l’aspiration de la pompe (fig. 9).
- Si une vanne de contrepression est installée, installer la vanne de sécurité comme indiqué à la Fig. 10.
- On recommande d’installer les manomètres avec l’échelle de 20% supérieure à la pression d’étalonnage de la vanne de sécurité.
- Pour réduire les pulsations on recommande d’installer un réservoir amortisseur en proximité de la vanne de refoulement de la pompe.

Les réservoirs les plus utilisés sont:

- Réservoirs à contact direct entre liquide de processus et coussin d’air / (chambre d’air); ils sont de simple conception, mais nécessitent de contrôles périodiques et du rétablissement du coussin d’air

- Réservoirs à membrane ou à vessie qui séparent le coussin d’air /gaz du liquide de processus; la pression de précharge, est généralement de l’ordre de 60÷75% de la pression maximum de service pour installation sur le refoulement

Les réservoirs doivent être périodiquement contrôlés pour vérifier l'intégrité de la m ssion correcte de précharge; la sélection des réservoirs doit être effectuée en considérant la compatibilité chimique des matériaux des parties en contact.
Si une vanne de contrepression est installée, monter le réservoir comme illustré dans la Fig. 11.

A) en cas de basse pression; pour un fonctionnement correct la pression de précharge du réservoir doit être supérieure à la pression d'étalonnage de la vanne de contrepression

B) en cas de pression élevée

Pour des informations supplémentaires sur l'installation et le dimensionnement des réservoirs, nous vous prions de bien vouloir contacter notre Bureau Technique.

Nous conseillons l'installation d'un clapet de non-retour si le refoulement de la pompe décharge dans une ligne en pression.

⇨ Pendant l'installation de la pompe et des accessoires on recommande de prévoir également les vannes d'interception afin de faciliter les opérations d'entretien; la Fig. 13 montre une installation typique.

⇨ Suivre les instructions suivantes quand il faut pomper des liquides qui tendent à cristalliser ou pour des suspensions qui tendent à sédimenter :

- pour prévenir la sédimentation maintenir la suspension correctement agitée
- éviter l'installation de lignes verticales sur le goulot de refoulement
- avant d'arrêter la pompe prévoir un cycle de lavage de la pompe et des tuyaux
- la construction des lignes d'aspiration et de déchargement doit prévoir le drainage complet

3. DEMARRAGE

Connexions électriques:

- brancher le moteur électrique au réseau
- en vérifier le sens de rotation; une flèche sur le moteur indique le sens de rotation correct

Le moteur électrique ne doit être connecté que par du personnel qualifié!

ATTENTION
Ne pas démarrer la pompe avec les vannes d'aspiration/refoulement fermées
Ne pas fermer les vannes avec la pompe en fonction

Avant de démarrer la pompe vérifier les points suivants:

- Contrôler le niveau de l'huile du mécanisme
- Contrôler le niveau du liquide hydraulique de la tête
- Vérifier que la pompe est protégée contre les surpressions (installation de la vanne de sécurité)
- Vérifier que toutes les connexions hydrauliques sont correctement serrées
- Positionner la poignée du réglage sur "zéro", voir paragraphe 1.3.1.
- Démarrer la pompe sans pression de refoulement et augmenter progressivement le débit jusqu'à 100%
- Vérifier que le liquide dans la chambre hydraulique ne contient pas de bulles d'air; appuyer sur la vanne de rétablissement jusqu'à la complète sortie de l'air
- Laisser la pompe en fonction pendant quelques minutes
- Augmenter progressivement la pression jusqu'à atteindre les performances requises

ATTENTION
NE PAS DEPASSER LES PERFORMANCES MAXIMUM IMPRIMEES SUR LA PLAQUETTE DE LA POMPE
Si le système n'est pas muni de manomètre, nous conseillons l'installation d'un manomètre temporaire pour contrôler que la pression effective au démarrage n'excède pas la pression maximum admissible.

⇨ Les pompes sont autoamorçantes, toutefois des problèmes d'amorçage pourraient se vérifier avec des pompes de faible débit, des pistons de petit diamètre, en présence de vannes de contrepression. Dans ces cas il pourrait être nécessaire de faciliter l'amorçage en purgeant l'air de la tête et de la ligne d'aspiration.

ATTENTION
Si le liquide pompé est toxique, venimeux, agressif, inflammable ou pour quelconque raison dangereux, faire très attention en évitant des fuites accidentelles à travers les gaines ou les tuyaux pendant le démarrage ou les opérations d'entretien.
Pendant la manutention et l'élimination des substances dangereuses suivre toutes les recommandations du fournisseur et les lois locales en matière de sécurité

4.ENTRETIEN

4.1 Précautions

- Avant d'opérer sur la pompe vérifier que toutes les connexions électriques (de puissance et de contrôle) ont été débranchées du réseau et qu'elles ne sont plus alimentées.
- Décharger complètement la pression de la pompe et des tuyaux, drainer la section dans laquelle il faut effectuer l'entretien.
- Travailler en portant toujours les protections de sécurité requises
- Ne pas jeter dans la nature des substances polluantes telles que produits chimiques, huile lubrifiante, etc..
- Avant d'effectuer l'entretien sur la pompe ou sur le système lire attentivement les spécifications techniques du liquide pompé avec une attention particulière par rapport aux actions à prendre en cas de contact accidentel avec des fluides dangereux.

4.2 Mécanisme

Les pompes sont généralement fournies avec le premier remplissage d'huile; substituer l'huile de premier remplissage après 1500 heures de fonctionnement et successivement toutes les 4000 heures.
Substituer de toute façon l'huile tous les ans
Utiliser les huiles conseillées dans le tableau ci-dessous ou leurs équivalents.

Vérifier chaque semaine le niveau de l'huile et si nécessaire le rétablir en utilisant la même huile; vérifier également qu'il n'y ait pas de pertes à travers l'étanchéité de la tige piston et si nécessaire substituer l'anneau à lèvre.

AGIP	BP	ESSO	IP	MOBIL	SHELL
BLASIA 150	ENERGOL GR-XP150	SPARTAN EP 150	MELLANA OIL 150	MOBIL GEAR 629	OMALA OIL 150

4.3 Tête

Ne pas faire fonctionner la pompe sans liquide

Au moins tous les six mois démonter la tête comme indiqué ci-après:

- déconnecter les tuyaux d'aspiration et refoulement
- vider le liquide de processus de la tête et des tuyaux
- dévisser les vis de fixation de la tête au mécanisme
- démonter les vannes d'aspiration et refoulement

et effectuer les opérations suivantes:

- laver soigneusement les vannes d'aspiration et refoulement et vérifier s'il y a des parties usées ou éraflées; en cas affirmatif les substituer
- substituer les anneaux de l'étanchéité s'ils sont usés; étaler de la graisse sur les nouveaux anneaux avant de les monter
- vérifier la zone de glissement de l'étanchéité sur le piston, la superficie doit être dépourvue de rayures ou éraflures; substituer si abîmé

4.4 Pièces détachées conseillées

Pour faire face aux opérations d'entretien ordinaires et éviter des pertes de temps, on vous conseille d'avoir au moins les pièces détachées suivantes stockées:

- Un piston
- Deux séries d'étanchéité piston
- Une vanne d'aspiration complète
- Une vanne de refoulement complète
- Une série d'étanchéités du mécanisme

En commandant les pièces détachées, on vous prie de communiquer toujours le Modèle de la pompe et le numéro de fabrication.

5. IDENTIFICATION PANNES

Panne	Possible cause	Remède
Débit faible ou aucun débit	Réservoir étanche sans évent	Installer un évent ou ouvrir le couvercle du réservoir
	Aspiration d'air à travers les raccords, gaines, etc.	Serrer les connexions
	Poches d'air ou gaz dans la pompe ou dans les tuyaux	Faciliter la sortie de l'air
	Filtre ou ligne d'aspiration obstrués	Laver le filtre et/ou éliminer l'occlusion
	Vannes d'interception fermées	Ouvrir les vannes
	Hauteur excessive d'aspiration	Repositionner la pompe à la hauteur correcte
	Tension de vapeur et/ou température du liquide trop élevées	Refroidir le liquide
	Viscosité trop élevée, température du liquide trop baisse	Réchauffer le liquide
	Vannes de la pompe sales ou usées	Laver ou substituer les vannes
	Courses/min. inférieur au nominal	Vérifier la vitesse et l'alimentation électrique
	Diamètre des tuyaux d'aspiration trop petit	Vérifier la longueur et le diamètre de la ligne
	Vanne de sécurité calibrée à une valeur inférieure à la pression maximum de refoulement	Vérifier l'étalonnage de la vanne et la pression de service effective
	Longueur erronée de la course	Contrôler et régler selon nécessité
	Perte excessive à travers l'étanchéité	Comprimer l'étanchéité, vérifier l'usure du piston et de l'étanchéité, substituer les parties usées
	Vanne de sécurité en fonction, fuites à travers la vanne	Vérifier l'étalonnage correct et/ou nettoyer la vanne
Débit élevé	Pression de refoulement inférieure à la pression d'aspiration	Installer une vanne de contrepression
	Longueur erronée de la course	Contrôler et régler selon nécessité
	Vanne de contrepression en panne ou avec calibrage inapproprié	Modifier l'étalonnage ou substituer la vanne
	Courses/min. supérieur au nominal	Vérifier la vitesse et l'alimentation électrique
Surchauffe du moteur électrique	Pression de refoulement trop élevée	Contrôler l'étalonnage de la vanne de sécurité
	Ligne de refoulement dimensionnée de façon incorrecte	Vérifier la longueur et le diamètre de la ligne
	Connexions électriques incorrectes	Vérifier et corriger les connexions
Fonctionnement bruyant	Le lubrifiant dans le mécanisme et/ou réducteur manque	Remplir avec lubrifiant approprié
	Usure excessive du mécanisme et/ou réducteur	Faire la révision du mécanisme et/ou le réducteur
Vibrations des tuyaux	Diamètre des tuyaux trop petit	Augmenter le diamètre des tuyaux
	Réservoir amortisseur trop petit et/ou hors service	Réparer ou recalculer le volume du réservoir

6. *MANUTENTION ET STOCKAGE*

6.1 Manutention

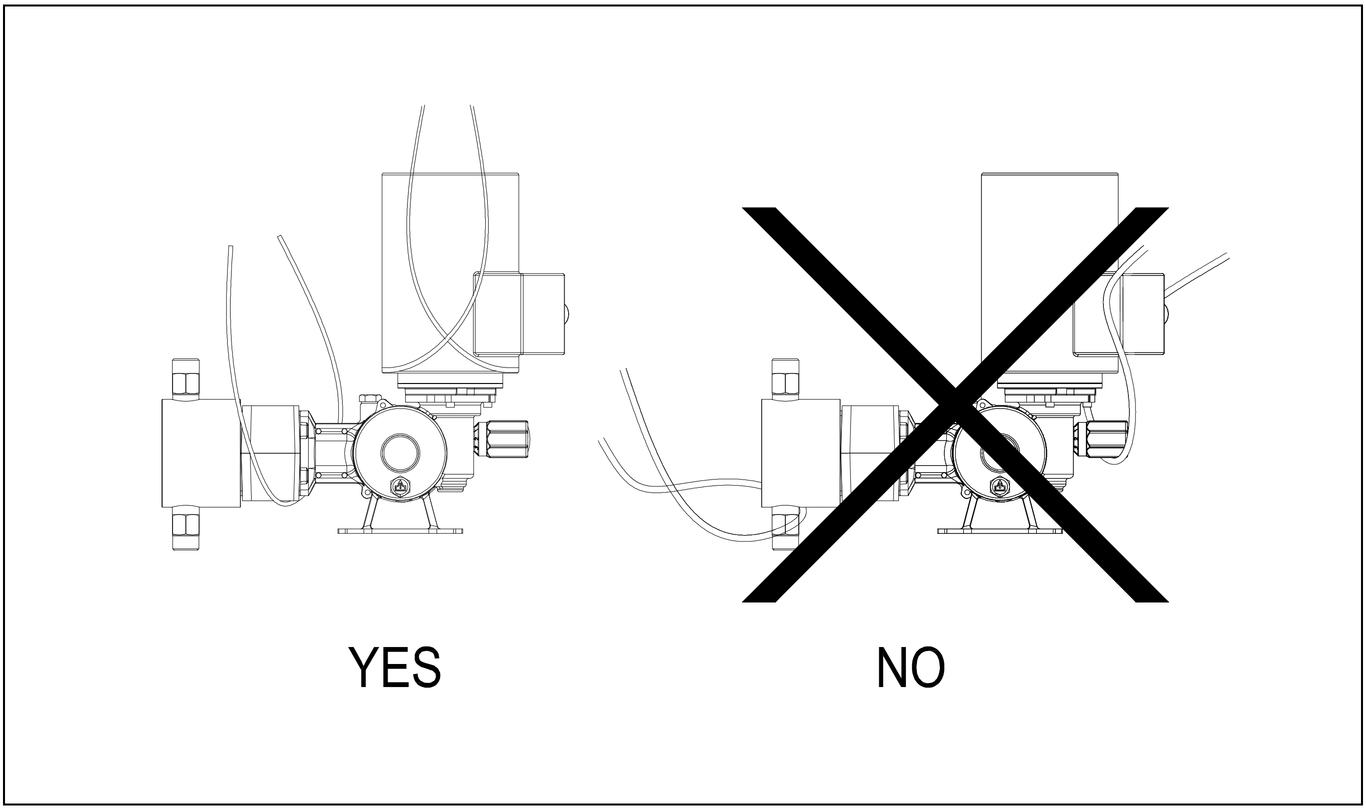
La figure ci-dessous illustre la façon correcte de manutentionner la pompe.
Si la pompe est montée sur une fondation avec pitons à œil de soulèvement, utiliser ces derniers pour la manutention.

⇨ **respecter de toute façon les instructions suivantes:**

- **ne pas élinguer, tirer ou pousser** les brides ou les ajutages de la tête
- **ne pas élinguer, tirer ou pousser le boîtier de la vanne de sécurité**
- **ne pas élinguer, tirer ou pousser** la poignée du réglage
- **ne pas élinguer, tirer ou pousser** le piston

⇨ **en soulevant des charges respectez les règles suivantes**

- porter un casque, gants et chaussures de protection
- ne pas s’arrêter sous des charges suspendues
- ne pas soulever de charges excessives
- soulevant manuellement des charges ne pas assumer des positions qui pourraient être nuisibles pour la colonne vertébrale et les muscles dorsaux.



6.2 Stockage et conservation

⚠ **ATTENTION**

Pendant le transport et le stockage la pompe doit être protégée contre l'humidité, l'eau salée, la pluie, la poussière, le sable et les rayons directes du soleil.

Si la pompe doit être stockée pour longtemps, suivre les instructions suivantes:

A. Stockage dans un lieu sec et aéré
La pompe peut être stockée pour une période d'un an sans prendre des précautions particulières.

B. Stockage dans un lieu avec humidité élevée
La pompe doit être hermétiquement protégée contre la condensation utilisant une quantité appropriée de sels de gel de silice; dans ces conditions le stockage est possible pour un an.

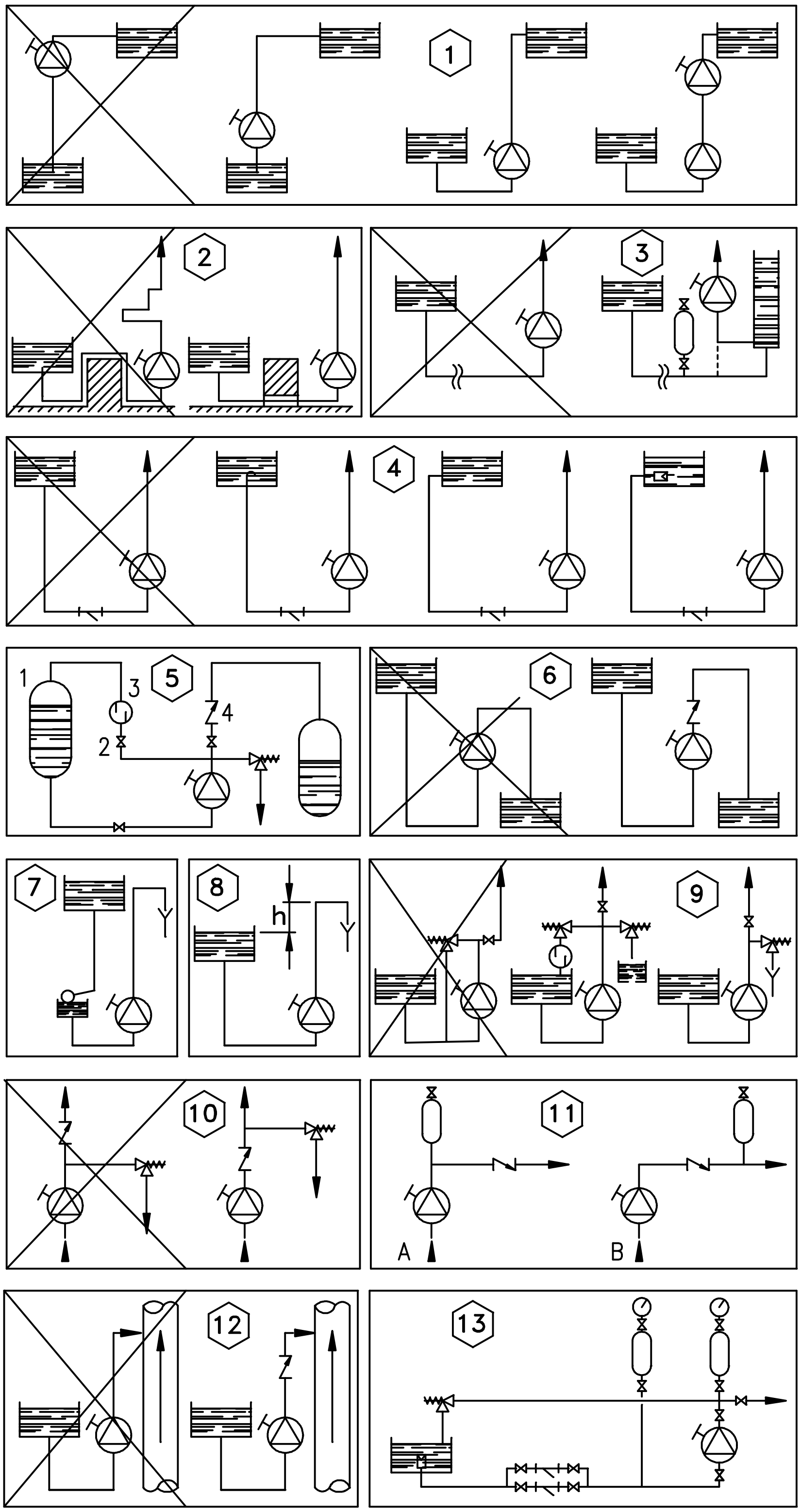
C. Stockage à l'extérieur
En plus des recommandations du point B, sont requises des protections supplémentaires contre la pluie, le sable, la poussière, les impuretés et les rayons directs du soleil.

D. Précautions après l'installation d'une pompe
Avant le démarrage contrôler que le mécanisme et la chambre hydraulique sont correctement remplis.
Si la mise en route est repoussée, actionner la pompe pour une heure chaque mois avec la poignée du réglage à "zéro", voir paragraphe 1.3.1.

Substituer de toute façon le lubrifiant tous les ans.
Substituer à nouveau le lubrifiant du mécanisme avant de la mise en route effective de la pompe.
Si, après l'installation, la pompe reste inactive pendant longtemps, respecter les précautions suivantes:

- démonter complètement la tête et laver soigneusement toutes les parties
- démonter, nettoyer et graisser l'étanchéité; remonter sans comprimer le presse-étoupe
- graisser toutes les surfaces traitées
- verser du lubrifiant de protection dans le mécanisme et dans le réducteur et actionner la pompe pour quelques minutes.
- au moment du démarrage, vider le lubrifiant de protection et remplir avec lubrifiant approprié
- conserver la pompe dans un endroit sec et protégé correctement de la poussière.

Tableau conseils pour l’installation



SERBATOIO TANK TANK	DEPÓSITO RESERVOIR
POMPA DOSATRICE DOSING PUMP DOSIERPUMPE	BOMBA DOSIFICADORA POMPE DOSEUSE
POMPA AUSILIARIA BOOSTER PUMP HILFSPUMPE	BOMBA AUXILIARA POMPE AUXILIAIRE
POLMONE SMORZATORE PULSATION DAMPER PULSATIONDÄMPFER	DEPÓSITO DE COMPENSACIÓN POUMON AMORTISSEUR
VALVOLA ON-OFF VALVE VENTIL	VÁLVULA VANNE
SERBATOIO IN PRESSIONE PRESSURIZED TANK TANK UNTER DRUCK	DEPÓSITO EN PRESIÓN RESERVOIR PRESSUR
FILTRO A “Y” “Y” FILTER “Y” FILTER	FILTRO DE “y” FILTRE A “Y”
SPIA WINDOW SCHAULGLAS	MIRILLA TEMOIN
VALVOLA DI CONTROPRESSIONE CHECK VALVE GEGENDRUCKVENTIL	VÁLVULA DE CONTRAPRESIÓN VANNE DE CONTREPRESSION
VALVOLA DI SICUREZZA PRESS RELIEF VALVE SICHERHEITSVENTIL	VÁLVULA DE SEGURIDAD VANNE DE SECURITE
VALVOLA A GALLEGGIANTE FLOAT-OPERATED VALVE SCHWIMMERVENTIL	VÁLVULA FLOTANTE VANNE A FLOTTEUR
MANOMETRO PRESSURE GAUGE MANOMETER	MANÓMETRO MANOMETRE

Manuale d’uso , manutenzione e installazione

POMPE DOSATRICI A PISTONE

Vi suggeriamo di leggere attentamente le istruzioni prima di installare ed avviare la pompa.
Le informazioni di questo manuale possono essere modificate senza alcun avviso e non costituiscono vincolo.

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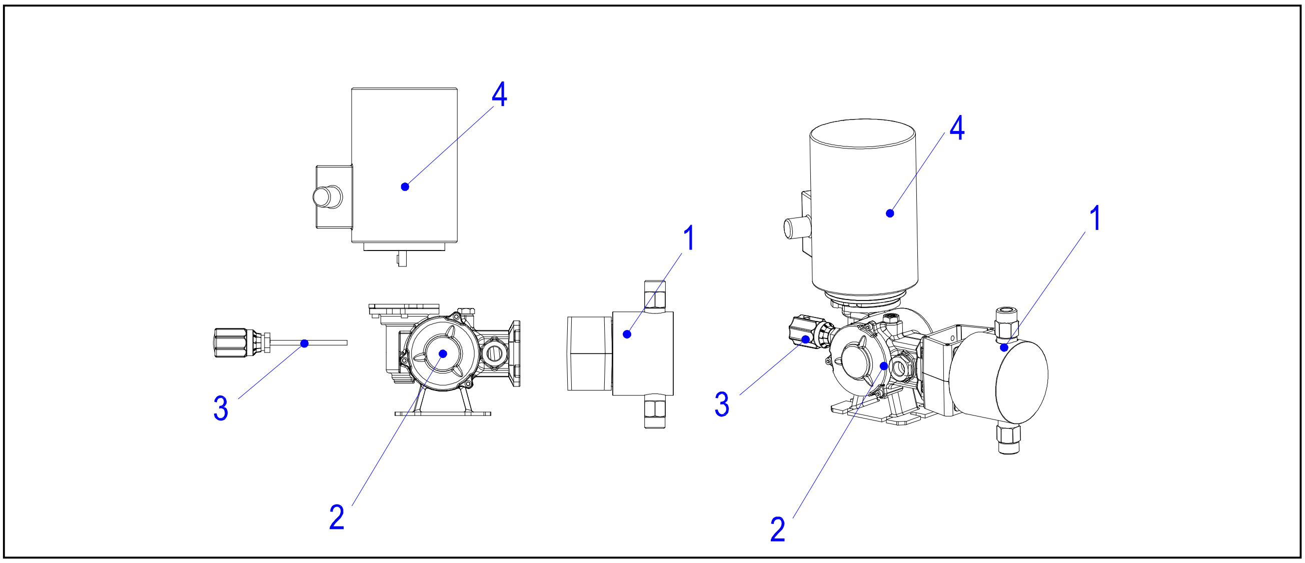
1. DESCRIZIONE



1	Testata	Cabeza	Pump head	Tête	Pumpenkopf
2	Meccanismo	Mecanismo	Mechanism	Mecanisme	Triebwerk
3	Regolazione	Regulaciòn	Adjustment	Régulation	Hubeinstellung
4	Motore	Motor	Motor	Moteur	Motor

La pompa dosatrice è una pompa volumetrica, alternativa i cui componenti principali sono: motore, riduttore, meccanismo, dispositivo di regolazione della corsa, testa pompante.

⇨ **La pompa dosatrice è costruita in accordo con i regolamenti italiani per la sicurezza e la prevenzione.**

Istruzioni per la sicurezza

⚠

ATTENZIONE
Evitare di superare la pressione massima ammessa
(per esempio installando una valvola di sicurezza)

Prima di iniziare a lavorare sulla pompa verificare attentamente quanto segue:

- che il motore elettrico sia scollegato dalla rete di alimentazione
- che la pressione sia stata scaricata dalla testata e tubazioni
- che parti in contatto con liquidi aggressivi e/o pericolosi siano state accuratamente lavate prima di essere maneggiate
- che gli operatori indossino i mezzi di protezione personale previsti dalle leggi vigenti

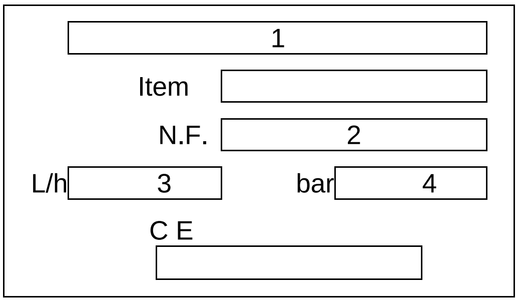
1.1 Applicazioni

La pompa dosatrice è un componente di processo capace di trasferire definite quantità di liquido con elevata precisione; è inoltre possibile variare la portata agendo su un apposito dispositivo.
Per ottenere le migliori prestazioni, la pompa deve essere selezionata considerando le prestazioni richieste e la compatibilità dei materiali di costruzione delle parti a contatto con il liquido.

Prima di impiegare una pompa per un uso diverso da quello originale, Vi suggeriamo di chiedere informazioni al nostro Ufficio Tecnico.

1.2 Targhetta di identificazione

Dimensioni reali: mm 65x35



1	Modello	Modelo	Model	Modèle	Modell Triebwerks
2	Numero di fabbrica	Número de matrícula	Serial Number	Numéro de fabrication	Baunummer
3	Portata	Caudal	Flow rate	Débit	Förderleistung
4	Pressione massima	Presión máxima	Maximum pressure	Maximum pressure	Maximaler Druck

1.3 Meccanismo e riduttore

Il meccanismo è il dispositivo che permette di trasformare il moto rotatorio del motore elettrico in alternativo e di azionare il pistone.

1.3.1 Regolazione della corsa

Per ottenere la maggior precisione, la pompa deve operare in condizioni ideali: quali velocità, pressione, viscosità costanti.

Modelli corsa 15-25 mm

La variazione da 0 al 100% della portata massima è ottenuta ruotando la manopola di regolazione in senso orario per quattro giri; ad ogni giro della manopola corrisponde ad una variazione del 25% della portata massima; inoltre la manopola è suddivisa in 10 parti corrispondenti ciascuna ad 1/40 della portata massima.

1.4 Testata

1.4.1 Principio di funzionamento

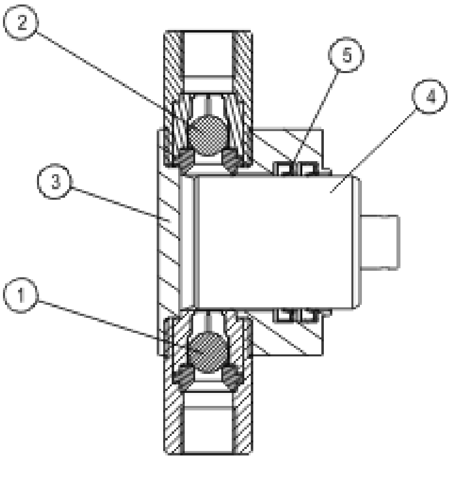
La tenuta (5) sul pistone (4) isola la testata dall’atmosfera; le valvole di aspirazione (1) e scarico (2) sono azionate dall’alternarsi di pressione positiva e negativa.

Aspirazione

Durante la corsa di aspirazione (pistone retrocedente) la differenza tra la pressione di aspirazione e la pressione all’interno della testata (3) provoca l’apertura della valvola di aspirazione (1).
Il liquido di processo è aspirato dalla linea di aspirazione all’interno della testata (3).

Scarico

Durante la corsa di scarico (pistone avanzante) la valvola di aspirazione (1) è chiusa e la valvola di scarico (2) si apre per effetto della pressione all’interno della testata (3). Il liquido di processo è pompato dalla testata (3) nella linea di scarico.



1	Valvola di aspirazione	Válvula de aspiracón	Suction valve	Vanne d’aspira	
2	Valvola di scarico	Válvula de impulsión	Discharge valve	Vanne de refoulement	Auslaßventil
3	Testata	Cabeza	Pump head	Tête	Prozeßkammer
4	Pistone	Pistón	Plunger	Piston	Kolben
5	Tenuta	Junta	Packing	Garniture	Kolbendichtung

1.4.2 Tenuta

Le pompe a pistone sono equipaggiate con tenute costituite da anelli a labbro in elastomero e non necessitano di alcuna regolazione.

2. *INSTALLAZIONE*

2.1 Precauzioni di sicurezza

- non lavorare da soli
- installare un teleruttore con protezione termica
- collegare la messa a terra del motore
- lavorando sulla pompa accertarsi che il motore elettrico o il servomotore non siano collegati alla rete
- utilizzando utensili elettrici in aree pericolose, osservare i regolamenti specifici
- tenere a portata di mano un kit di pronto intervento
- osservare le leggi locali per la sicurezza

Installazione

- L’altezza di installazione deve essere tale da facilitare le operazioni di manutenzione, la movimentazione, lo scarico e il rifornimento di lubrificante, lo smontaggio della testata
- Installare la pompa **senza tensioni** sul basamento e sulle connessioni della testa
- Installare la pompa con l’asse del pistone orizzontale e l’asse delle valvole verticale

Connessioni elettriche

PERICOLO

I motori e i componenti elettrici devono essere collegati in accordo alle leggi locali e solamente da personale qualificato.
Installare una protezione contro il sovraccarico o un sensore di temperatura.
Verificare il voltaggio, la frequenza, la velocità del motore e la potenza.
In aree pericolose osservare le disposizioni/leggi specifiche

2.2 Generalità

Per il buon funzionamento è fondamentale che la pompa sia correttamente installata:

- Prima di eseguire i collegamenti idraulici accertarsi che l’interno delle tubazioni, serbatoi, ecc. siano stati accuratamente puliti; è comunque consigliabile installare, vicino al boccaglio di aspirazione, un filtro temporaneo che raccolga i residui e le scorie dell’impianto.
- Collegare le tubazioni evitando di mettere in tensione i boccagli della pompa
- Installare tubazioni di sezione adeguata per la massima portata della pompa, evitare strozzature o percorsi tortuosi dove potrebbero formarsi sacche d’aria o gas.
- Installare prima e dopo la testata, una valvola di intercettazione e un giunto a croce, ciò consentirà di smontare la pompa senza svuotare l’impianto e di installare eventuali accessori quali manometri, polmoni ecc.
- Nel caso di testate in materia plastica, installare giunti flessibili sia in aspirazione che in mandata.

ATTENZIONE

Per prevenire seri danni le linee di aspirazione e di scarico devono essere correttamente progettate, dimensionate e collegate alla pompa

2.3 Linea di aspirazione (vedi tabella suggerimenti per l’installazione)

- Prevedere la tubazione più corta possibile (fig. 1), evitare percorsi tortuosi (fig. 2)
- La tubazione deve essere dimensionata considerando che il rapporto tra la massima portata istantanea e la portata media è 3,14.
- Per Vostra informazione la velocità consigliata nelle tubazioni dovrebbe essere di 0,5÷0,8 m/sec con liquidi aventi viscosità simile all’acqua e peso specifico fino a 1200 Kg/m3.
- Installare un filtro di aspirazione permanente; il filtro deve avere una cartuccia filtrante di 150 μm e una perdita di carico inferiore 0.2 m.c.a. (calcolati considerando i su citati coefficienti). Il filtro deve essere facilmente accessibile e periodicamente controllato/lavato.
- Nel caso di tubazioni lunghe, per evitare problemi di cavitazione, installare vicino alla pompa un vaso di espansione o un polmone (fig. 3) .
- Non collegare la pompa al fondo del serbatoio (fig. 4) per evitare l’aspirazione di impurità.
- L’aspirazione da un serbatoio sottovuoto può essere ottenuta collegando le tubazioni come da fig. 5. Aprire la valvola 2 e verificare il riempimento attraverso la specola 3, chiudere la valvola 2, avviare la pompa; la valvola di non ritorno 4 impedisce il reflusso del liquido a pompa ferma

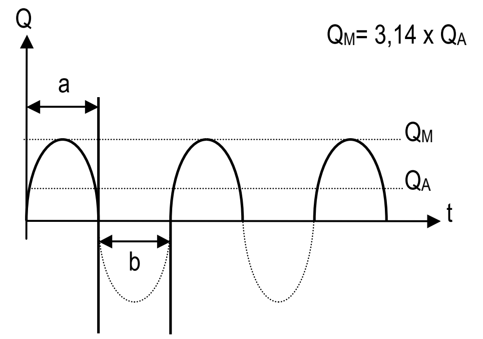


Fig. D

Q	Portata	Caudal	Flow rate	Débit	Förderleistung
Q_A	Portata media	Caudal promedio	Medium Flow rate	Débit moyen	Duchschnittliche
Q_M	Portatamassima	Caudal máximo	Maximum flow rate	Débit maximale	Max. Durchflussmenge
a	Corsa di scarico	Carrera de impulsión	Discharge stroke	Course de refoulement	Auslaßhub
b	Corsa di aspirazione	Carrera de aspiración	Suction stroke	Course d’aspiration	Ansaughub
t	Tempo	Tiempo	Time	Temps	Zeit

2.4 Linea di mandata (vedi tabella suggerimenti per l’installazione)

- Verificare che tra mandata e aspirazione esista una differenza positiva di pressione di almeno 50÷100 Kpa; se le condizioni dell’impianto non consentono una differenza positiva, si può ottenere lo scopo installando una valvola di contropressione (fig. 6) o abbassando il serbatoio di aspirazione (fig. 7) o alzando la linea di mandata (fig. 8).
- Per motivi di sicurezza è obbligatorio installare una valvola di sicurezza al fine di prevenire danneggiamenti in conseguenza di sovrappressioni impreviste; lo scarico della valvola di sicurezza dovrebbe essere visibile e collegato al serbatoio o ad un drenaggio. Non è consigliabile collegare lo scarico all’aspirazione della pompa (fig. 9).
- Qualora sia installata una valvola di contropressione, installare la valvola di sicurezza come indicato alla Fig. 10.
- E’ consigliabile installare i manometri aventi la scala del 20% superiore alla pressione di taratura della valvola di sicurezza.
- Per ridurre le pulsazioni è consigliabile installare un polmone smorzatore in prossimità della valvola di mandata della pompa.

I polmoni più usati sono:

- polmoni a contatto diretto tra liquido di processo e cuscino di aria/ (camera d’aria); sono di semplice concezione, ma richiedono periodici controlli e ripristino del cuscino d’aria.
- polmoni a membrana o sacca che separano il cuscino di aria/gas dal liquido di processo; la pressione di precarica, è generalmente pari al 60÷75% della massima pressione di esercizio per installazione sulla mandata

I polmoni devono essere periodicamente controllati per verificare l’integrità della membrana/sacca e la corretta pressione di precarica; la selezione dei polmoni deve essere effettuata considerando la compatibilità chimica dei

materiali delle parti a contatto.
Consigliamo l'installazione di una valvola di non ritorno qualora la mandata della pompa scarichi in una linea in pressione.

⇨ Durante l'installazione della pompa e degli accessori è consigliabile prevedere anche le valvole di intercettazione al fine di facilitare le operazioni di manutenzione; la Fig. 13 mostra una installazione tipica.

⇨ Seguire le seguenti istruzioni quando si debbano pompare liquidi che tendono a cristallizzare o sospensioni che tendono a sedimentare:

- per prevenire la sedimentazione mantenere la sospensione correttamente agitata
- evitare l'installazione di linee verticali sopra il boccaglio di mandata
- prima di fermare la pompa prevedere un ciclo di lavaggio della pompa e tubazioni
- la costruzione delle linee di aspirazione e scarico deve prevedere il completo drenaggio

3. AVVIAMENTO

Connessioni elettriche:

- collegare il motore elettrico alla rete
- verificarne il senso di rotazione; una freccia sul motore indica il corretto senso di rotazione

Il motore elettrico deve essere collegato solamente da personale qualificato!

⚠

ATTENZIONE
Non avviare la pompa con le valvole di aspirazione/mandata chiuse
Non chiudere le valvole con la pompa in funzione

Prima di avviare la pompa verificare i seguenti punti:

- Controllare il livello dell'olio del meccanismo
- Verificare che la pompa sia protetta contro sovrappressioni (installazione della valvola di sicurezza)
- Verificare che tutte le connessioni idrauliche siano correttamente serrate
- Posizionare la manopola della regolazione su "zero".
- Avviare la pompa senza pressione di scarico e aumentare progressivamente la portata fino al 100%
- Lasciare la pompa in funzione per alcuni minuti

⚠

ATTENZIONE
NON SUPERARE LE PRESTAZIONI MASSIME STAMPIGLIATE SULLA TARGHETTA DELLA POMPA
Se l'impianto è sprovvisto di manometro, consigliamo l'installazione di un manometro temporaneo per controllare che la pressione effettiva all'avviamento non ecceda la massima pressione ammissibile.

⇨ Le pompe sono autoadescanti, tuttavia si potrebbero verificare alcuni problemi di innesco con pompe di bassa portata, pistoni di piccolo diametro, in presenza di valvole di contropressione. In questi casi potrebbe essere necessario favorire l'innesco spurgando l'aria dalla testata e dalla linea di aspirazione.

ATTENZIONE
Se il liquido pompato è tossico, velenoso, aggressivo, infiammabile o per qualsiasi motivo pericoloso, usare particolare attenzione evitando perdite accidentali attraverso le guarnizioni o le tubazioni durante l'avviamento o le operazioni di manutenzione.
Durante la movimentazione e lo smaltimento delle sostanze pericolose seguire tutte le raccomandazioni del fornitore e le leggi locali in materia di sicurezza

4. MANUTENZIONE

4.1 Precauzioni

- Prima di operare sulla pompa accertarsi che tutte le connessioni elettriche (di potenza e di controllo) siano state scollegate dalla rete e che non siano più alimentate.
- Scaricare completamente la pressione dalla pompa e dalla tubazione, drenare la sezione nella quale si deve eseguire la manutenzione.
- Lavorare indossando sempre le protezioni di sicurezzza richieste
- Non riversare nell'ambiente sostanze inquinanti quali prodotti chimici, olio lubrificante, ecc.
- Prima di eseguire la manutenzione sulla pompa o sull'impianto leggere attentamente le specifiche tecniche del liquido pompato con particolare riguardo alle azioni da intraprendere in caso di contatto accidentale con fluidi pericolosi.

4.2 Meccanismo

Le pompe sono generalmente fornite con il primo rifornimento di olio; sostituire l'olio di primo riempimento dopo 1500 ore di funzionamento e successivamente ogni 4000 ore.

Sostituire comunque l'olio ogni anno

Impiegare gli oli consigliati nella tabella sottostante o loro equivalenti.

Verificare settimanalmente il livello dell'olio e se necessario ripristinarlo impiegando lo stesso olio; verificare anche che non vi siano perdite attraverso la tenuta dell'asta pistone e se necessario sostituire l'anello a labbro.

AGIP	BP	ESSO	IP	MOBIL	SHELL
BLASIA 150	ENERGOL GR-XP150	SPARTAN EP 150	MELLANA OIL 150	MOBIL GEAR 629	OMALA OIL 150

4.3 Testata

Non far funzionare la pompa senza liquido

Almeno ogni sei mesi smontare la testata come qui di seguito indicato:

- scollegare le tubazioni di aspirazione e mandata
- scaricare il liquido di processo dalla testata e dalle tubazioni
- svitare le viti di fissaggio della testata al meccanismo
- smontare le valvole di aspirazione e mandata

ed eseguire le seguenti operazioni:

- lavare accuratamente le valvole di aspirazione e scarico e verificare se vi sono parti usurate o scalfite; in caso affermativo sostituirle
- sostituire gli anelli della tenuta se sono usurati; spalmare con grasso i nuovi anelli prima di montarli
- verificare l'area di scorrimento della tenuta sul pistone, la superficie deve essere priva di rigature o scalfitture; sostituire se danneggiato.

4.4 Ricambi consigliati

Per far fronte alle normali operazioni di manutenzione ed evitare perdite di tempo, Vi consigliamo di tenere a magazzino almeno i seguenti ricambi:

- Un pistone
- Due serie di tenuta pistone
- Una valvola di aspirazione completa
- Una valvola di mandata completa

Ordinando le parti di ricambio, Vi preghiamo comunicare sempre il Modello della pompa ed il Numero di fabbricazione.

5. INDIVIDUAZIONE AVARIE

Avaria	Possibile causa	Rimedio
Portata bassa o nessuna portata	Serbatoio sigillato senza sfiato	Installare uno sfiato o aprire il coperchio del serbatoio
	Aspirazione di aria attraverso i raccordi, guarnizioni, ecc.	Serrare le connessioni
	Sacche d'aria o gas nella pompa o nelle tubazioni	Agevolare l'uscita dell'aria
	Filtro o linea d'aspirazione ostruiti	Lavare il filtro e/o rimuovere l'occlusione
	Valvole di intercettazione chiuse	Aprire le valvole
	Eccessiva altezza d'aspirazione	Riposizionare la pompa alla corretta altezza
	Tensione di vapore e/o temperatura del liquido troppo elevate	Raffreddare il liquido
	Viscosità troppo elevata, temperatura del liquido troppo bassa	Riscaldare il liquido
	Valvole della pompa sporche o usurate	Lavare o sostituire le valvole
	Corse/min. inferiore al nominale	Verificare la velocità e 'alimentazione elettrica
	Diametro della tubazione di aspirazione troppo piccolo	Verificare la lunghezza e il diametro della linea
	Valvola di sicurezza tarata ad un valore inferiore alla massima pressione di mandata	Verificare la taratura della valvola e l'effettiva pressione di esercizio
	Errata lunghezza della corsa	Controllare e regolare secondo necessità
	Eccessiva perdita attraverso la tenuta	Comprimere la tenuta, verificare l'usura del pistone e della tenuta, sostituire le parti usurate
	Valvola di sicurezza in funzione, perdite attraverso la valvola	Verificare la corretta taratura e/o pulire la valvola
Portata elevata	Pressione di mandata inferiore alla pressione di aspirazione	Installare una valvola di contropressione
	Errata lunghezza della corsa	Controllare e regolare secondo necessità
	Valvola di contropressione in avaria o con taratura non adeguata	Modificare la taratura o sostituire la valvola
	Corse/min. superiore al nominale	Verificare la velocità e l'alimentazione elettrica
Surriscaldamento del motore elettrico	Pressione di mandata troppo alta	Controllare la taratura della valvola di sicurezza
	Linea di mandata non correttamente dimensionata	Verificare la lunghezza e il diametro della linea
	Errati collegamenti elettrici	Verificare e correggere i collegamenti
Funzionamento rumoroso	Mancanza di lubrificante nel meccanismo e/o riduttore	Riempire con lubrificante idoneo
	Usura eccessiva del meccanismo e/o riduttore	Revisionare il meccanismo e/o il riduttore
Vibrazioni nelle tubazioni	Diametro delle tubazioni troppo piccolo	Aumentare il diametro delle tubazioni
	Polmone smorzatore troppo piccolo e/o fuori servizio	Riparare o ricalcolare il volume del polmone

6. *MOVIMENTAZIONE E IMMAGAZZINAGGIO*

6.1 Movimentazione

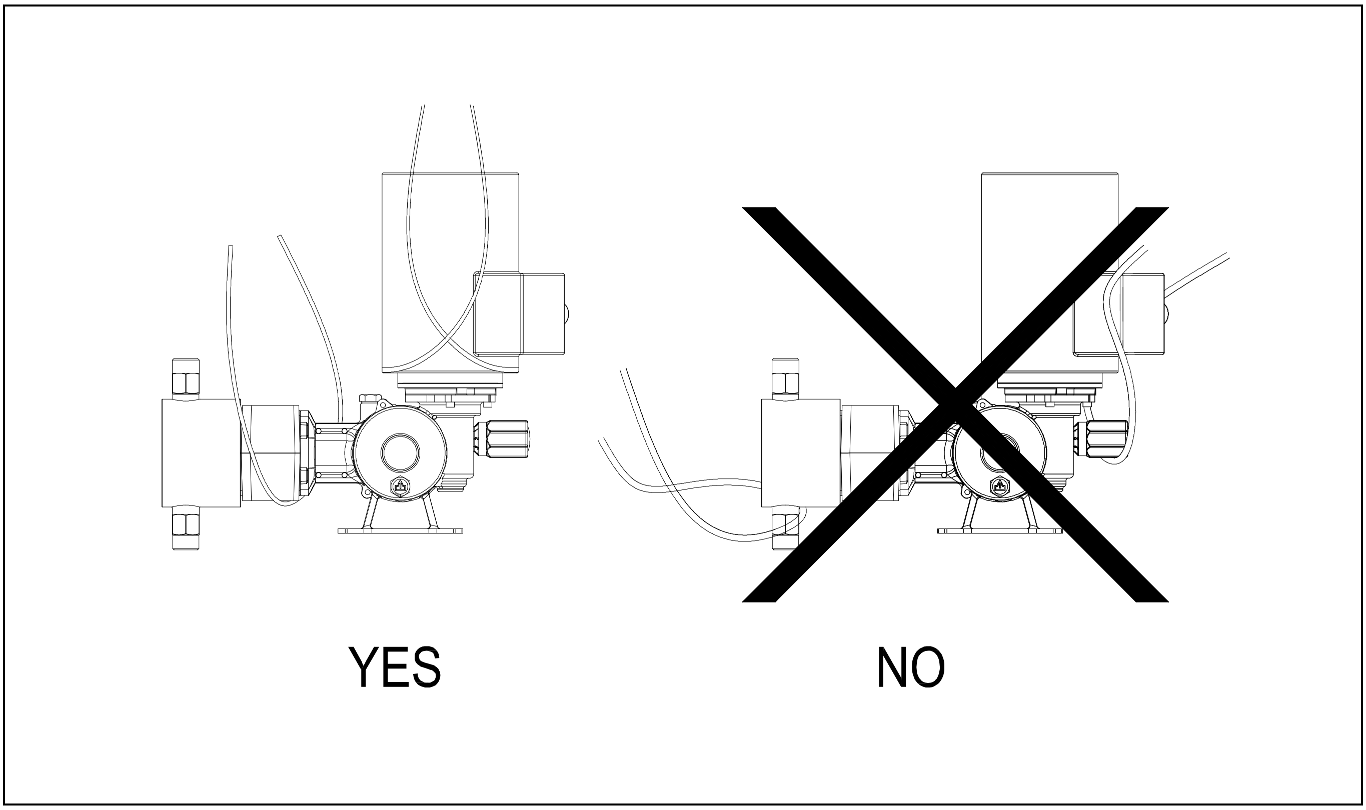
La figura sottostante illustra il modo corretto di movimentare la pompa.
Se la pompa è montata su un basamento con golfari di sollevamento, utilizzare questi ultimi per la movimentazione.

⇨ **osservare comunque le seguenti istruzioni:**

- **non imbragare, tirare o spingere** le flange o i boccagli della testata
- **non imbragare, tirare o spingere** la manopola della regolazione
- **non imbragare, tirare o spingere** il pistone

⇨ **sollevando carichi osservare quanto segue**

- indossare elmetto, guanti e scarpe protettive
- non sostare sotto carichi sospesi
- non sollevare manualmente carichi eccessivi
- sollevando manualmente carichi non assumere posizioni che potrebbero essere dannose per la colonna vertebrale e i muscoli dorsali.



6.2 Immagazzinaggio e conservazione

ATTENZIONE

Durante il trasporto e il magazzinaggio la pompa deve essere protetta contro l’umidità, l’acqua salata, la pioggia, la polvere, la sabbia e i raggi diretti del sole.

Se la pompa dovesse essere immagazzinata per lungo tempo, seguire le seguenti istruzioni:

A. Immagazzinaggio in luogo asciutto e ventilato

La pompa può essere immagazzinata per un periodo di un anno senza prendere particolari precauzioni.

B. Immagazzinaggio in luogo con elevata umidità

La pompa deve essere ermeticamente protetta contro la condensa utilizzando una adeguata quantità di sali di gel di silice; in queste condizioni è possibile l’immagazzinaggio per un anno.

C. Immagazzinaggio all’esterno

In aggiunta alle raccomandazioni del punto B, sono richieste ulteriori protezioni contro la pioggia, sabbia, polvere, impurità e raggi diretti del sole.

D. Precauzioni dopo l’installazione di una pompa

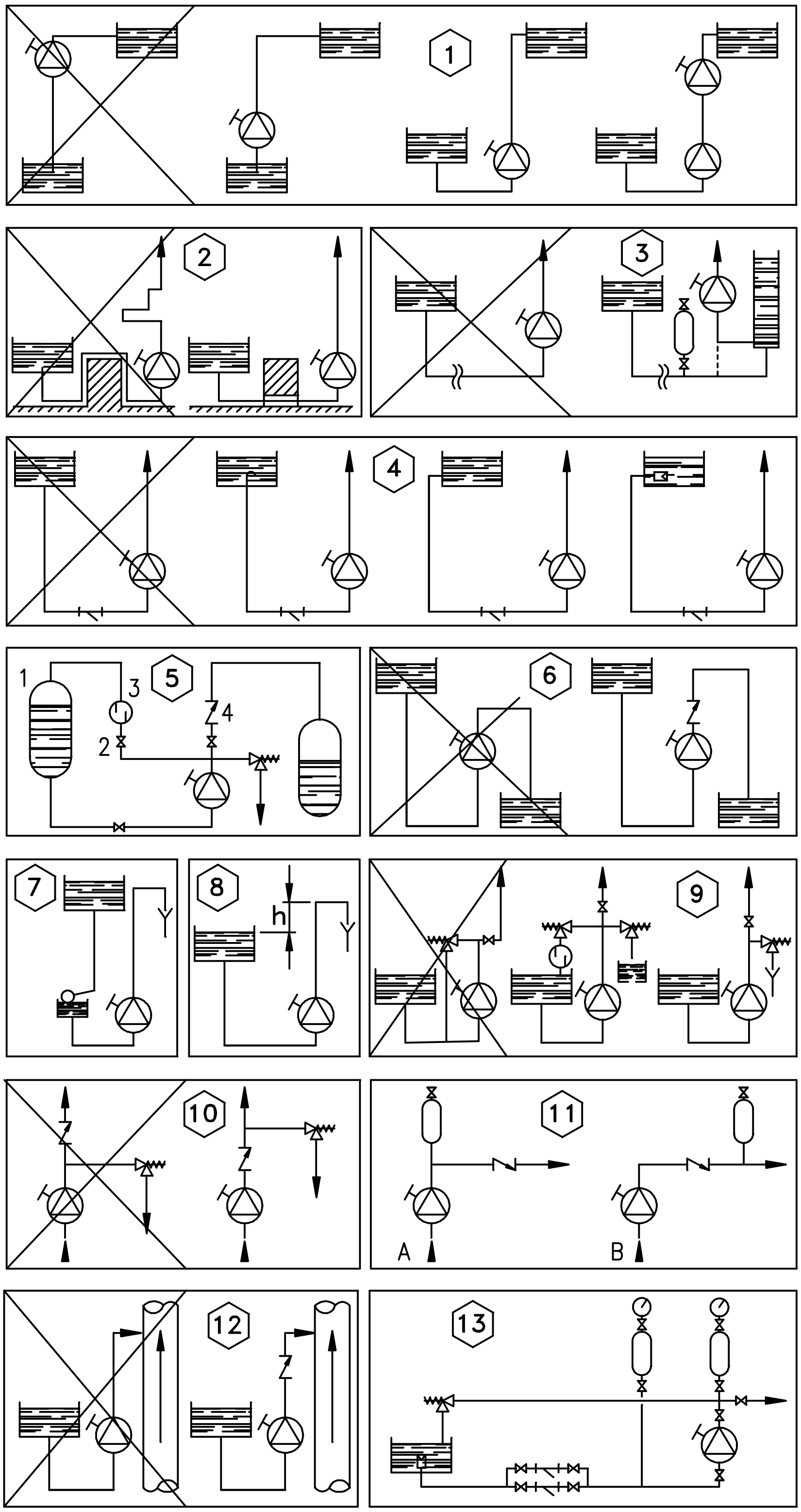
Prima dell’avviamento controllare che il meccanismo sia correttamente rifornito.
Se la messa in servizio viene dilazionata, azionare la pompa per un’ora ogni mese con la manopola della regolazione a “zero”.

Sostituire comunque il lubrificante ogni anno.

Sostituire nuovamente il lubrificante del meccanismo prima della effettiva messa in funzione della pompa.
Se, dopo l’installazione, la pompa dovesse rimanere inattiva per un lungo periodo, osservare le seguenti precauzioni:

- smontare completamente la testata e lavare accuratamente tutte le parti
- smontare, pulire e ingrassare la tenuta; rimontare senza comprimere il premistoppa
- ingrassare tutte le superfici lavorate
- versare lubrificante protettivo nel meccanismo e nel riduttore e azionare la pompa per alcuni minuti.
- al momento dell’avviamento, scaricare il lubrificante protettivo e riempire con lubrificante adatto
- conservare la pompa in un luogo asciutto e adeguatamente protetta dalla polvere

Tabella suggerimenti per l'installazione



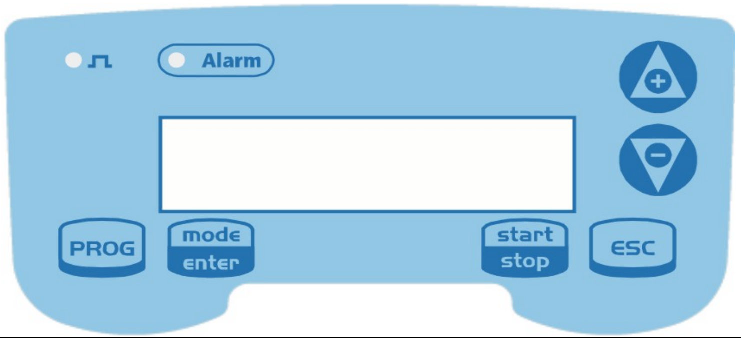
SERBATOIO TANK TANK	DEPÓSITO RESERVOIR
POMPA DOSATRICE DOSING PUMP DOSIERPUMPE	BOMBA DOSIFICADORA POMPE DOSEUSE
POMPA AUSILIARIA BOOSTER PUMP HILFSPUMPE	BOMBA AUXILIARA POMPE AUXILIAIRE
POLMONE SMORZATORE PULSATION DAMPER PULSATIONDÄMPFER	DEPÓSITO DE COMPENSACIÓN POUMON AMORTISSEUR
VALVOLA ON-OFF VALVE VENTIL	VÁLVULA VANNE
SERBATOIO IN PRESSIONE PRESSURIZED TANK TANK UNTER DRUCK	DEPÓSITO EN PRESIÓN RESERVOIR PRESSUR
FILTRO A "Y" "Y" FILTER "Y" FILTER	FILTRO DE "y" FILTRE A "Y"
SPIA WINDOW SCHAULGLAS	MIRILLA TEMOIN
VALVOLA DI CONTROPRESSIONE CHECK VALVE GEGENDRUCKVENTIL	VÁLVULA DE CONTRAPRESIÓN VANNE DE CONTREPRESSION
VALVOLA DI SICUREZZA PRESS RELIEF VALVE SICHERHEITSVENTIL	VÁLVULA DE SEGURIDAD VANNE DE SECURITE
VALVOLA A GALLEGGIANTE FLOAT-OPERATED VALVE SCHWIMMERVENTIL	VÁLVULA FLOTANTE VANNE A FLOTTEUR
MANOMETRO PRESSURE GAUGE MANOMETER	MANÓMETRO MANOMETRE

ATTACHMENT 04

TEKNAEVO TPG

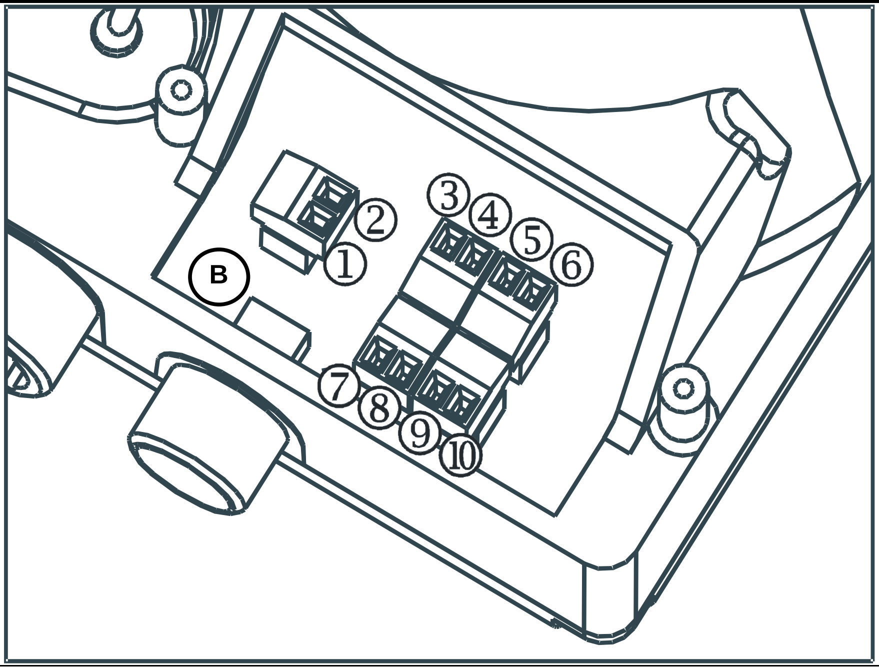
INSTRUCTIONS MANUAL	EN
HANDBUCH	DE
MANUAL DE INSTALACION	ES
MANUEL D’INSTALLATION	FR
MANUALE D’INSTALLAZIONE	IT
MANUAL DE INSTALAÇÃO	PT
KULLANIM KLAVUZU	TK

Control panel – TEKNA TPG



PROG	Access to the programming menu
mode enter	When pressed during the pump operation phase, it cyclically displays the programmed values on the display; When pressed at the same time ⊕ or ⊖ keys, it increases or decreases a value dependent on the selected operating mode. During programming it carries out an “enter” function, meaning that it confirms entry to the various menu levels and modifications within the same.
start stop	Starts and stops the pump. In the event of a level alarm (alarm function only), flow alarm and active memory alarm, it deactivates the signal on the display.
ESC	Used to “exit” the various menu levels. Before definitively exiting the programming phase, you will be asked if you wish to save any changes
⊕	Used to run upwards through the menu or increase the numerical values to be changed. Can be used to start dosage in Batch mode
⊖	Used to run downwards through the menu, or decrease the numerical values to be changed.
⎍	Flashing green LED during dosage
Alarm	Red LED that lights up in various alarm situations

Electrical connections



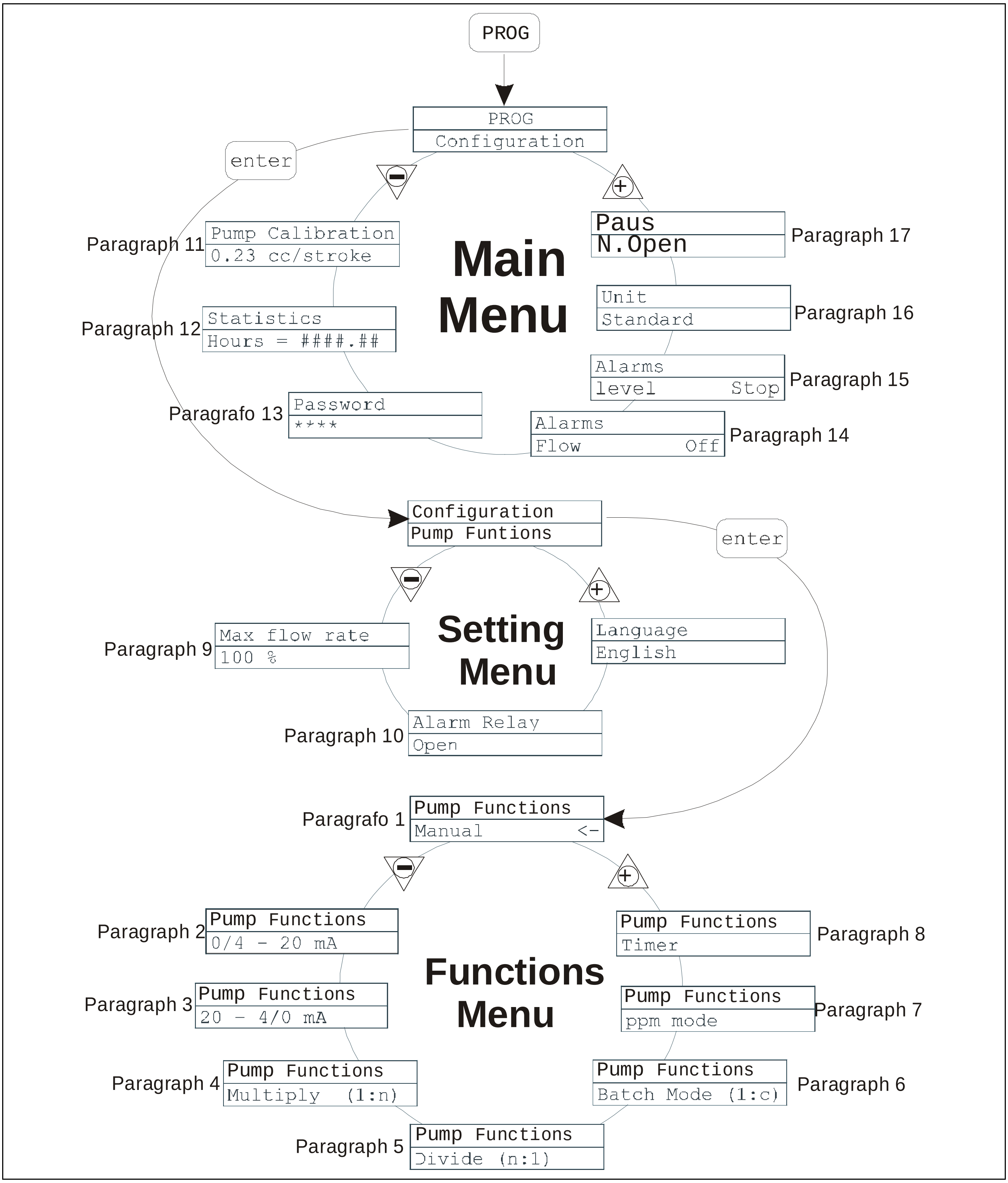
1	Alarm relay	
2		
3	Pole +	4-20 mA input signal Input Impedante: 200 ohm
4	Pole -	
5	-Remote control input (start-stop) -Pause signal input	
6		
7	-Frequency signal input (water-meter pulse-sender) -Trigger signal input	
8		
9	Flow sensor input	
10		
B	Input level control	

Programmiermenü Tekna TPG

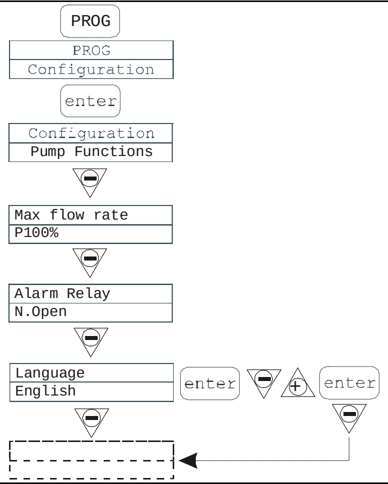
You can access the programming menu by pressing the PROG key for over three seconds. The ⊕ ⊖ keys can be used to run through the menu items, with the mode enter key being used to access changes.
The pump is programmed in constant mode in the factory. The pump automatically returns to the operating mode after 1 minute of no activity. Any data entered in these circumstances will not be saved.

The esc key can be used to exit the various programming levels. Upon exiting programming, the display will show:

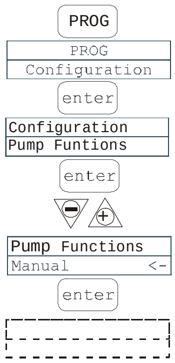
```
Exit              ∇ Δ   Exit
   Don't Save               Save      mode enter to confirm the selection
```

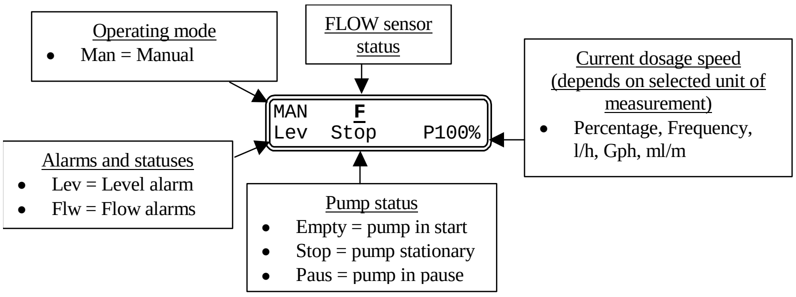
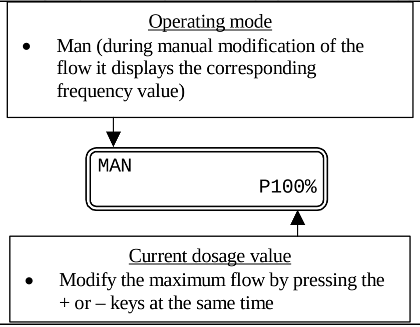

PROG
PROG
Configuration
enter
Main Menu
Paragraph 11
Pump Calibration
0.23 cc/stroke
Paragraph 12
Statistics
Hours = ####.##
Paragrafo 13
Password
****
Paus
N.Open
Paragraph 17
Unit
Standard
Paragraph 16
Alarms
level Stop
Paragraph 15
Alarms
Flow Off
Paragraph 14
Configuration
Pump Funtions
enter
Setting Menu
Paragraph 9
Max flow rate
100 %
Language
English
Paragraph 10
Alarm Relay
Open
Paragrafo 1
Pump Functions
Manual <-
Functions Menu
Paragraph 2
Pump Functions
0/4 - 20 mA
Paragraph 3
Pump Functions
20 - 4/0 mA
Paragraph 4
Pump Functions
Multiply (1:n)
Paragraph 5
Pump Functions
Divide (n:1)
Paragraph 8
Pump Functions
Timer
Paragraph 7
Pump Functions
ppm mode
Paragraph 6
Pump Functions
Batch Mode (1:c)

Setting the Language

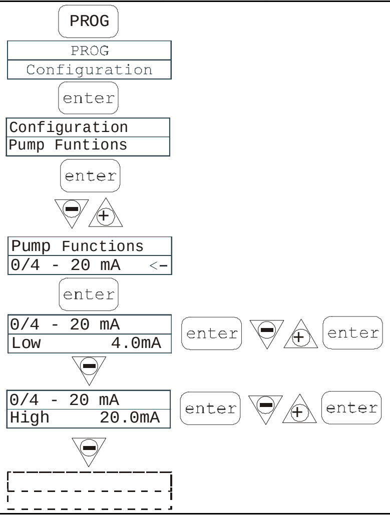
Programming	Operation
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open Language English enter enter	Makes it possible to select the language. The pump is set in English in the factory. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the new value. Press mode enter to confirm and return to the main menu

Paragraph 1 – Manual Dosage

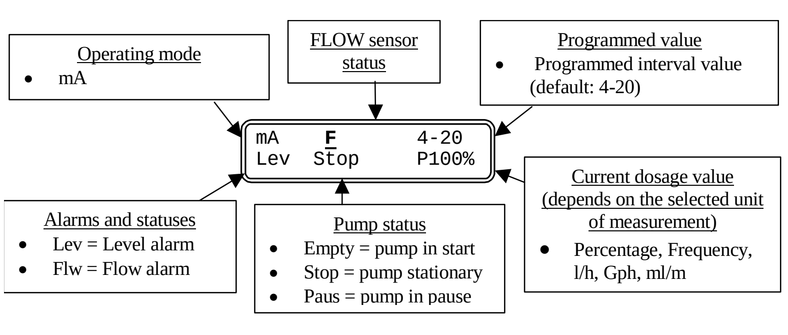
Programming	Operation
 PROG PROG Configuration enter Configuration Pump Funtions enter Pump Functions Manual <- enter	The pump operates in constant mode. The flow can only be manually regulated by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

Display during Operation	Display during Setting (MODE key)
 MAN F Lev Stop P100% Operating mode • Man = Manual FLOW sensor status Current dosage speed (depends on selected unit of measurement) • Percentage, Frequency, l/h, Gph, ml/m Alarms and statuses • Lev = Level alarm • Flw = Flow alarms Pump status • Empty = pump in start • Stop = pump stationary • Paus = pump in pause	 Operating mode • Man (during manual modification of the flow it displays the corresponding frequency value) Current dosage value • Modify the maximum flow by pressing the + or – keys at the same time

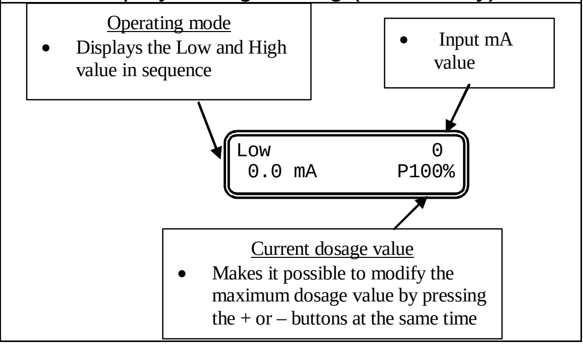
Paragraph 2 - Dosage Proportional to Signal 0/4-20

Programming	Operation
 PROG PROG Configuration enter Configuration Pump Funtions enter Pump Functions 0/4 - 20 mA <- enter 0/4 - 20 mA Low 4.0mA enter enter 0/4 - 20 mA High 20.0mA enter enter	The pump proportionally doses at a signal of (0)4-20 mA. On the basis of the factory settings, the pump interrupts dosage at 4mA and doses at the maximum set frequency when it receives 20 mA. These two values can be modified during programming. The maximum frequency can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

Display during Operation

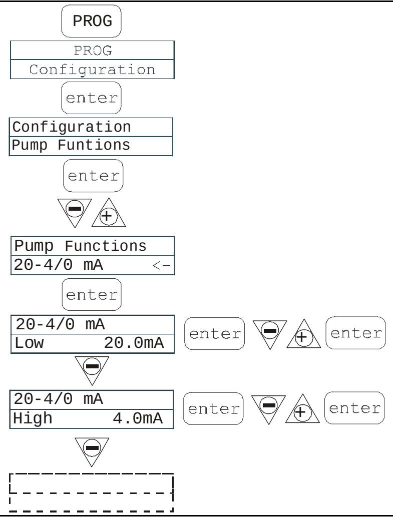

Operating mode
• mA
FLOW sensor status
Programmed value
• Programmed interval value (default: 4-20)
mA F 4-20
Lev Stop P100%
Current dosage value (depends on the selected unit of measurement)
• Percentage, Frequency, l/h, Gph, ml/m
Alarms and statuses
• Lev = Level alarm
• Flw = Flow alarm
Pump status
• Empty = pump in start
• Stop = pump stationary
• Paus = pump in pause

Display during Setting (MODE key)


Operating mode
• Displays the Low and High value in sequence
• Input mA value
Low 0
0.0 mA P100%
Current dosage value
• Makes it possible to modify the maximum dosage value by pressing the + or – buttons at the same time

Paragraph 3 - Dosage Proportional to Signal 20-4/0 mA

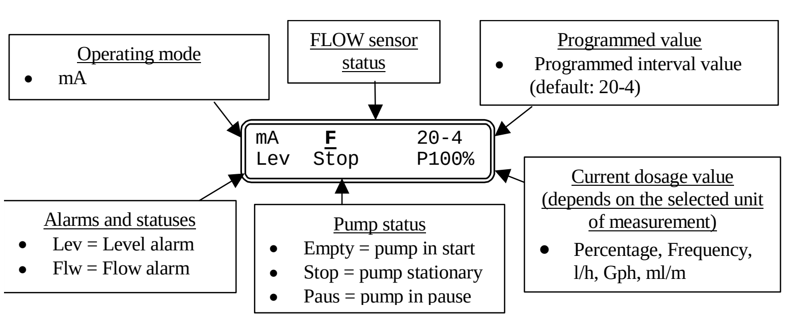
Programming


PROG
PROG
Configuration
enter
Configuration
Pump Funtions
enter
Pump Functions
20-4/0 mA <-
enter
20-4/0 mA
Low 20.0mA
enter
enter
20-4/0 mA
High 4.0mA
enter
enter

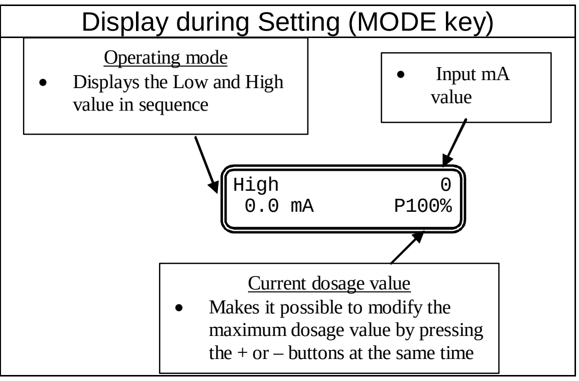
Operation

The pump proportionally doses at a signal of 20-4(0) mA. On the basis of the factory settings, the pump interrupts dosage at 20mA and doses at the maximum set frequency when it receives 4 mA. These two values can be modified during programming. The maximum frequency can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

Display during Operation

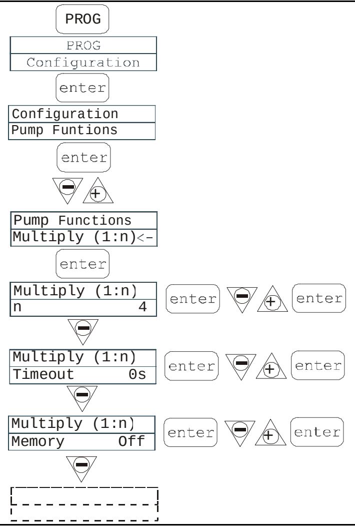

Operating mode
• mA
FLOW sensor status
Programmed value
• Programmed interval value (default: 20-4)
mA F 20-4
Lev Stop P100%
Current dosage value (depends on the selected unit of measurement)
• Percentage, Frequency, l/h, Gph, ml/m
Alarms and statuses
• Lev = Level alarm
• Flw = Flow alarm
Pump status
• Empty = pump in start
• Stop = pump stationary
• Paus = pump in pause

Display during Setting (MODE key)


Operating mode
• Displays the Low and High value in sequence
• Input mA value
High 0
0.0 mA P100%
Current dosage value
• Makes it possible to modify the maximum dosage value by pressing the + or – buttons at the same time

Paragraph 4 – Proportional to External Impulses (multiplication)

Programming

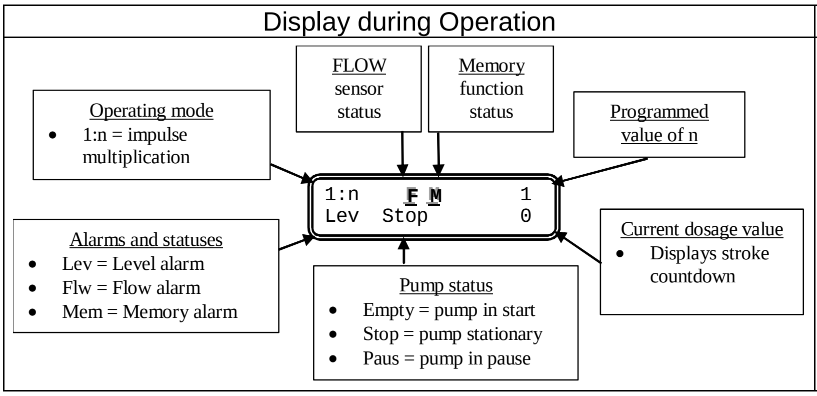

PROG
PROG
Configuration
enter
Configuration
Pump Funtions
enter
Pump Functions
Multiply (1:n)<-
enter
Multiply (1:n)
n 4
enter
enter
Multiply (1:n)
Timeout 0s
enter
enter
Multiply (1:n)
Memory Off
enter
enter

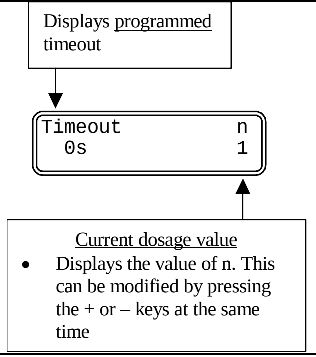
Operation

The pump doses in proportion to an external signal (i.e.: impulse launch counter). With every signal received, the pump makes the programmed "n" number of strikes. The pump automatically sets the dosage frequency, adapting it to the time that passes between two successive signals. It is possible to set the time (timeout) in seconds, beyond which the pump resets the interval count in order to avoid dosages over excessively long times. The pump has a memory function, which signals the reception of a signal during dosage. If set to Off, it merely sends a signal, if set to On it sends a signal and memorises the impulses, then executes them when it has finished receiving signals.

The value of "n" can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

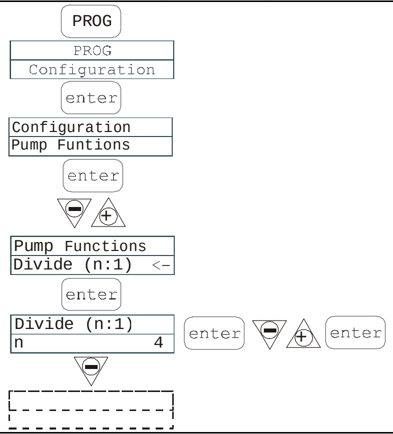
Display during Operation | Display during Setting (MODE key)


FLOW sensor status
Memory function status
Operating mode
• 1:n = impulse multiplication
Programmed value of n
1:n F M 1
Lev Stop 0
Alarms and statuses
• Lev = Level alarm
• Flw = Flow alarm
• Mem = Memory alarm
Current dosage value
• Displays stroke countdown
Pump status
• Empty = pump in start
• Stop = pump stationary
• Paus = pump in pause


Displays programmed timeout
Timeout n
0s 1
Current dosage value
• Displays the value of n. This can be modified by pressing the + or – keys at the same time

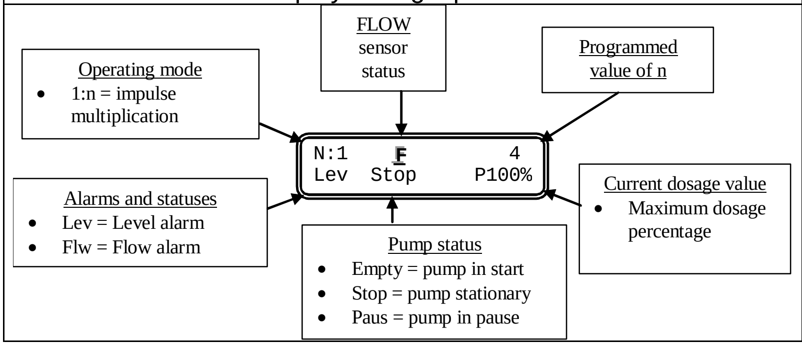
Paragraph 5 – Proportional to External Impulses (division)

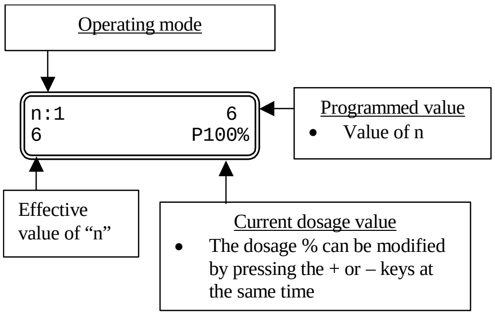
Programming | Operation


PROG
PROG
Configuration
enter
Configuration
Pump Funtions
enter
Pump Functions
Divide (n:1) <-
enter
Divide (n:1)
n 4
enter
enter

The pump doses in proportion to an external signal (i.e.: impulse launch counter). At every "n" signals, the pump makes a strike. You can set the value of "n" during programming. By programming the value of "n" you set the maximum dosage %. This value can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

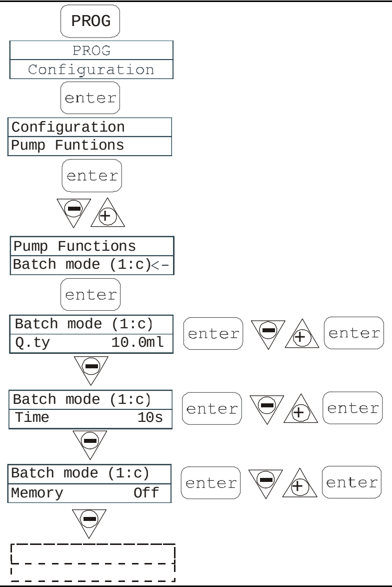
Display during Operation | Display during Setting (MODE key)


FLOW sensor status
Programmed value of n
Operating mode
• 1:n = impulse multiplication
N:1 F 4
Lev Stop P100%
Alarms and statuses
• Lev = Level alarm
• Flw = Flow alarm
Current dosage value
• Maximum dosage percentage
Pump status
• Empty = pump in start
• Stop = pump stationary
• Paus = pump in pause


Operating mode
n:1 6
6 P100%
Programmed value
• Value of n
Effective value of "n"
Current dosage value
• The dosage % can be modified by pressing the + or – keys at the same time

Paragraph 6 – Proportional to External Impulses (batch dosage)

Programming | Operation

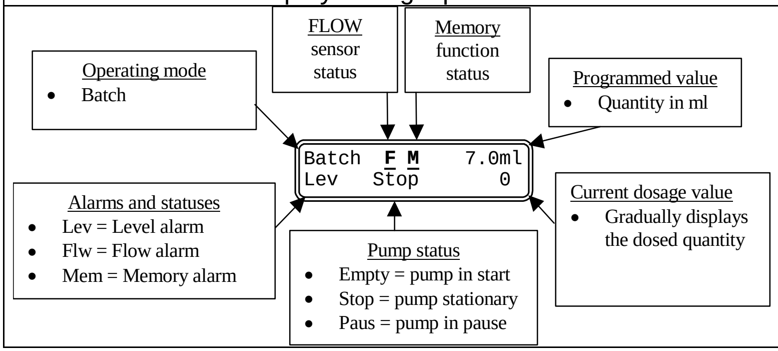

PROG
PROG
Configuration
enter
Configuration
Pump Funtions
enter
Pump Functions
Batch mode (1:c)<-
enter
Batch mode (1:c)
Q.ty 10.0ml
enter
enter
Batch mode (1:c)
Time 10s
enter
enter
Batch mode (1:c)
Memory Off
enter
enter

The pump doses in proportion to an external signal (i.e.: impulse launch counter). In this case, it is possible to set the quantity to be dosed in ml and the time within which to complete dosage.

Dosage can be started manually by pressing the ⊕ key, or by using a remote control. The start stop key interrupts dosage, which can be reset by pressing the ⊕ key, or started again by pressing the start stop key again.

The quantity to be dosed can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease i.

Display during Operation


Batch F M 7.0ml
Lev Stop 0

FLOW sensor status

Memory function status

Operating mode
- Batch

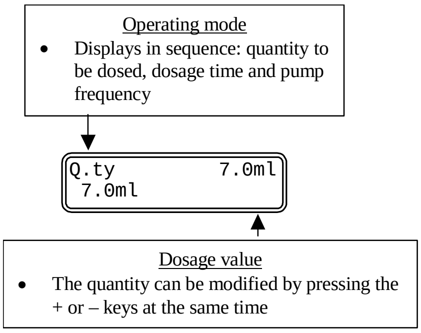
Programmed value
- Quantity in ml

Alarms and statuses
- Lev = Level alarm
- Flw = Flow alarm
- Mem = Memory alarm

Current dosage value
- Gradually displays the dosed quantity

Pump status
- Empty = pump in start
- Stop = pump stationary
- Paus = pump in pause

Display during Setting (MODE key)

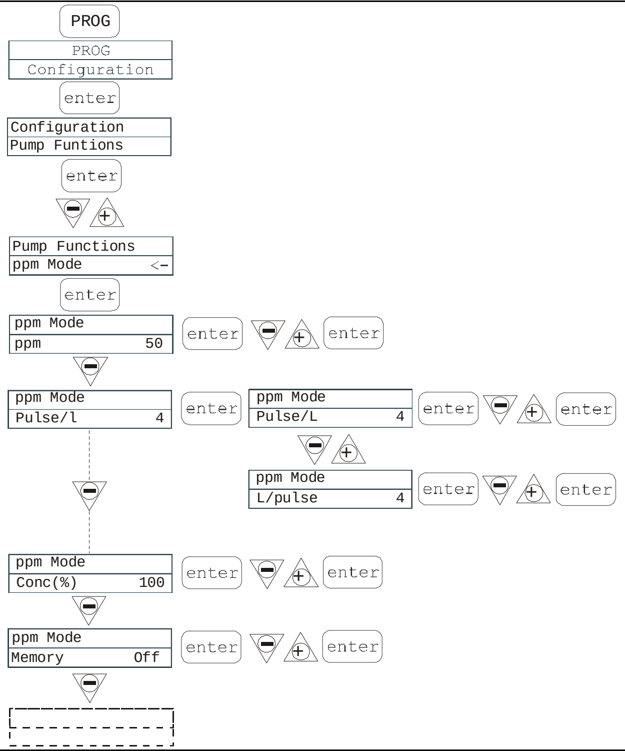

Q.ty 7.0ml
7.0ml

Operating mode
- Displays in sequence: quantity to be dosed, dosage time and pump frequency

Dosage value
- The quantity can be modified by pressing the + or – keys at the same time

Paragraph 7 – Proportional to External Impulses (ppm dosage)

Programming


PROG
PROG
Configuration
enter
Configuration
Pump Funtions
enter
Pump Functions
ppm Mode <-
enter
ppm Mode
ppm 50
enter
enter
ppm Mode
Pulse/l 4
enter
ppm Mode
Pulse/L 4
enter
enter
ppm Mode
L/pulse 4
enter
enter
ppm Mode
Conc(%) 100
enter
enter
ppm Mode
Memory Off
enter
enter

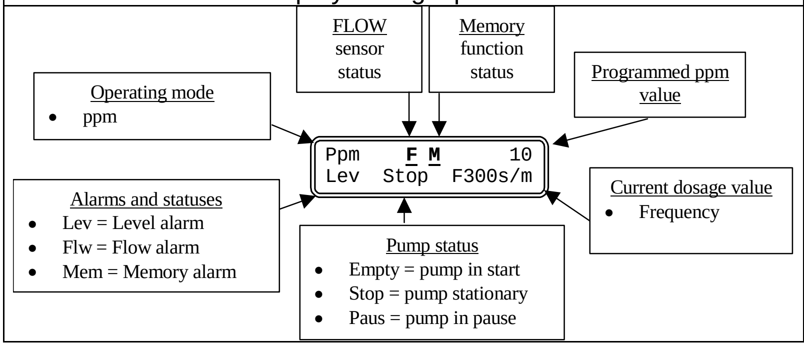
Operation

The pump doses in proportion to an external signal (i.e.: impulse launch counter), automatically calculating the relationship between incoming signals and pump strokes on the basis of the programmed ppm value.

The data to be entered is the ppm value, the impulse/litre ratio (or litre/impulse) of the counter and the concentration of the product to be dosed.

The dosage frequency can be modified during operation, by pressing the mode enter ⊕ keys at the same time to increase the flow, or the mode enter ⊖ keys to decrease it.

Display during Operation


Ppm F M 10
Lev Stop F300s/m

FLOW sensor status

Memory function status

Operating mode
- ppm

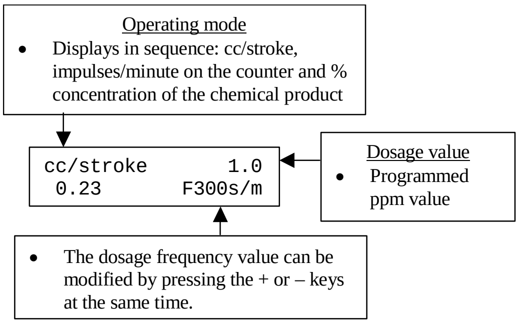
Programmed ppm value

Alarms and statuses
- Lev = Level alarm
- Flw = Flow alarm
- Mem = Memory alarm

Current dosage value
- Frequency

Pump status
- Empty = pump in start
- Stop = pump stationary
- Paus = pump in pause

Display during Setting (MODE key)


cc/stroke 1.0
0.23 F300s/m

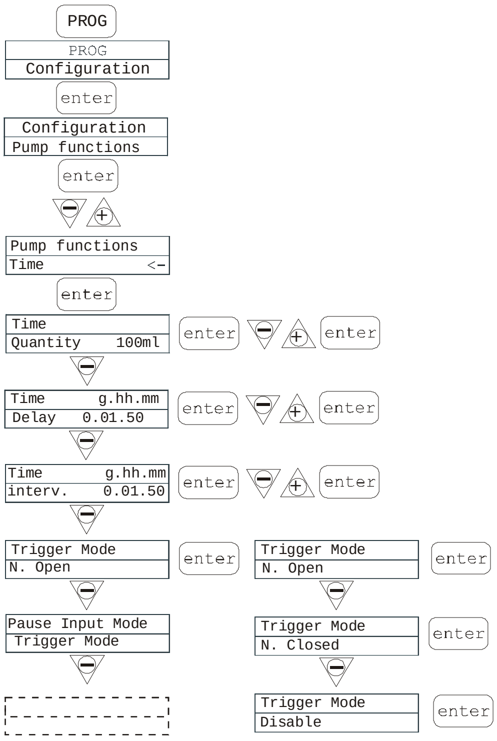
Operating mode
- Displays in sequence: cc/stroke, impulses/minute on the counter and % concentration of the chemical product

Dosage value
- Programmed ppm value

- The dosage frequency value can be modified by pressing the + or – keys at the same time.

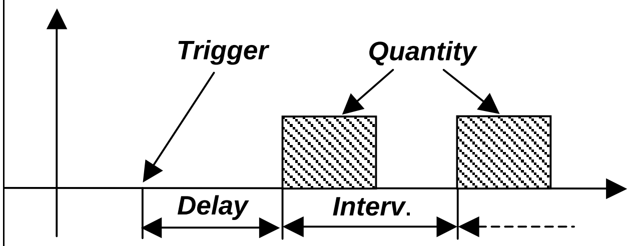
Paragraph 8 – Timed Dosage **(Frequency signal input “TRIGGER” activated)**

Programming

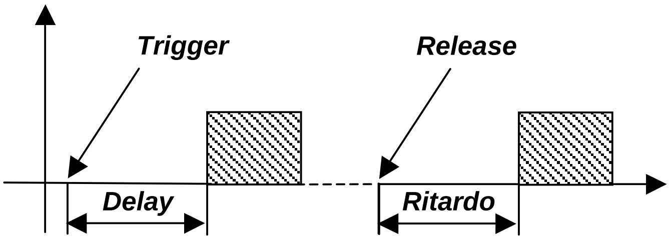

PROG
PROG
Configuration
enter
Configuration
Pump functions
enter
Pump functions
Time <–
enter
Time
Quantity 100ml
enter
enter
Time g.hh.mm
Delay 0.01.50
enter
enter
Time g.hh.mm
interv. 0.01.50
enter
enter
Trigger Mode
N. Open
enter
Trigger Mode
N. Open
enter
Pause Input Mode
Trigger Mode
Trigger Mode
N. Closed
enter
Trigger Mode
Disable
enter

Operation

After receipt of the ***TRIGGER*** signal set, the pump doses a quantity that can be programmed in ml. It is possible to set a delay time before the dosing (***Delay***) and the interval between subsequent dosings (**Interv.**) as illustrated in the diagram:


Trigger
Quantity
Delay
Interv.

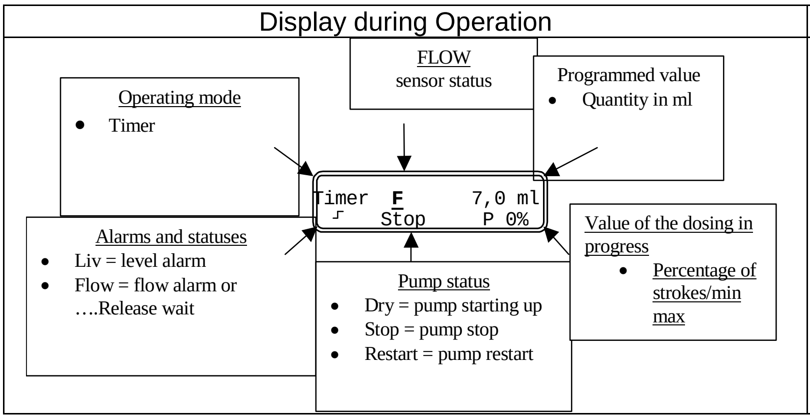
By setting for example an ***Interval.*** time = 0, a system is obtained in which the programmed quantity is dosed after each ***TRIGGER*** signal (with any delay that has been set):


Trigger
Release
Delay
Ritardo

It is possible to start the dosing by pressing the + key, which, in practice, simulates the ***Trigger*** signal.
The ***Trigger*** signal can be set to ***N. Open*** (it is activated when the input passes from the open to the closed mode) or to ***N. Closed*** (it is activated when the input passes from the closed to the open mode).
The ***Trigger*** signal is locked during dosing (its receipt is neither stored nor managed).
The ***Pause*** (***Remote input***) input cannot be programmed and its activation stops the dosing, while its further deactivation makes the system wait again for the ***Trigger*** signal for a new dosing.

The dosage frequency can be modified while the pump is operating, by pressing the mode enter ⊕ keys at the same time to increase the frequency, or the mode enter ⊖ keys to decrease it.

Display during Operation


Timer F 7,0 ml
Stop P 0%

Operating mode
- Timer

FLOW
sensor status

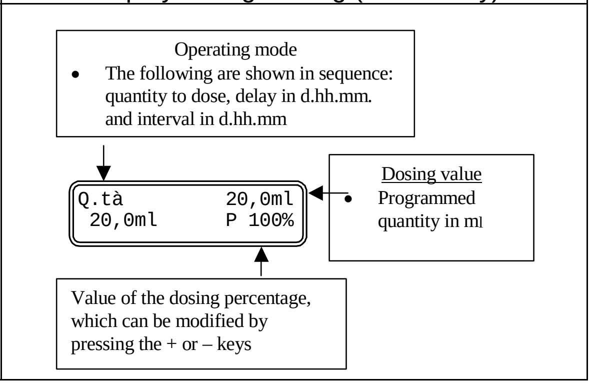
Programmed value
- Quantity in ml

Alarms and statuses
- Liv = level alarm
- Flow = flow alarm or
….Release wait

Pump status
- Dry = pump starting up
- Stop = pump stop
- Restart = pump restart

Value of the dosing in progress
- Percentage of strokes/min max

Display during Setting (MODE key)


Q.tà 20,0ml
20,0ml P 100%

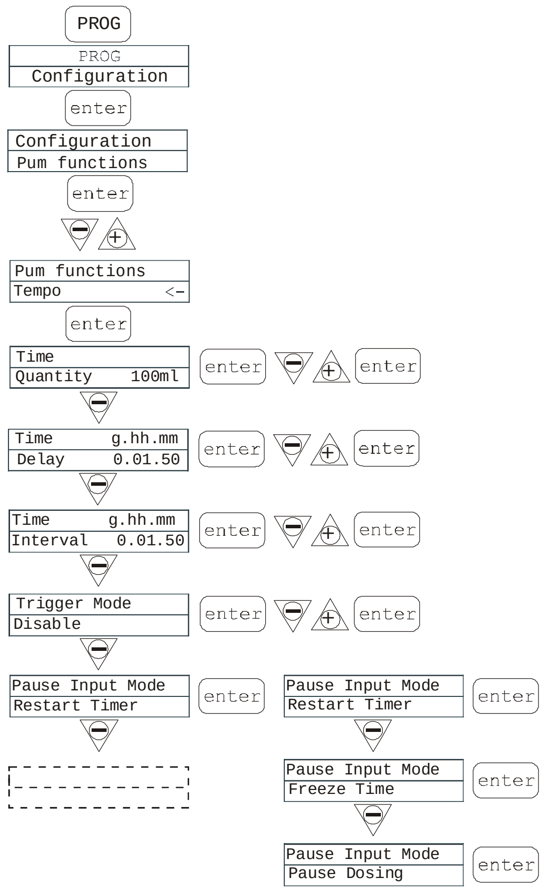
Operating mode
- The following are shown in sequence: quantity to dose, delay in d.hh.mm. and interval in d.hh.mm

Dosing value
- Programmed quantity in ml

Value of the dosing percentage, which can be modified by pressing the + or – keys

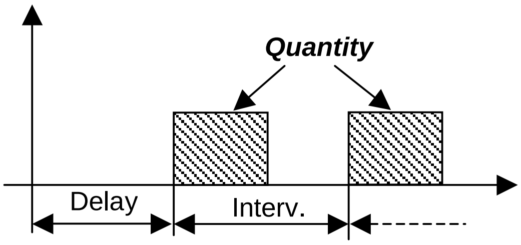
Paragraph 8 – Timed Dosage **(Frequency signal input "TRIGGER" not activated)**

Programming


PROG
PROG
Configuration
enter
Configuration
Pum functions
enter
Pum functions
Tempo <-
enter
Time
Quantity 100ml
enter
enter
Time g.hh.mm
Delay 0.01.50
enter
enter
Time g.hh.mm
Interval 0.01.50
enter
enter
Trigger Mode
Disable
enter
enter
Pause Input Mode
Restart Timer
enter
Pause Input Mode
Restart Timer
enter
Pause Input Mode
Freeze Time
enter
Pause Input Mode
Pause Dosing
enter

Operation

The pump doses a programmed quantity in ml. It is possible to set a pump delay time (***Delay***) when the pump is started and an interval between two successive dosings (***Interval***), as illustrated in the diagram:


Quantity
Delay
Interv.

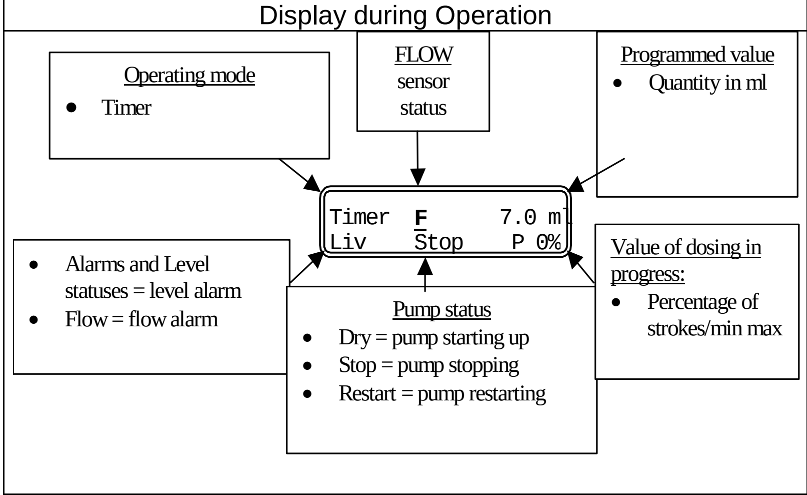
The ***Delay*** and ***Interval*** times are in dd.hh.mm (days, hours, minutes)

The ***Pause*** input can be programmed in three different modes:

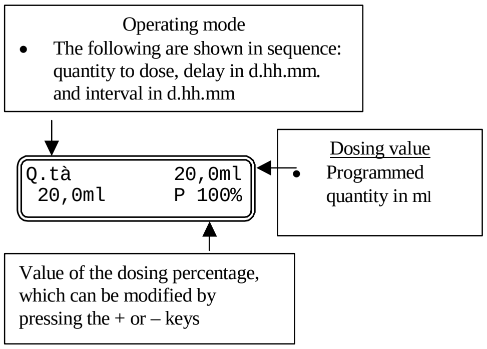
1. ***FreezeTime:*** when the pause is activated, the system cuts out the current time count and restarts it when the pause is deactivated.
2. ***Pause Dosing:*** with the pause activated, the system continues to count time the and stops the dosing.
3. ***Restart Timer***: when the pause is activated, the system stops the dosing and when the pause is deactivated the count starts again from the beginning.

The dosage frequency can be modified while the pump is operating, by pressing the mode enter ⊕ keys at the same time to increase the frequency, or the mode enter ⊖ keys to decrease it.

Display during Operation

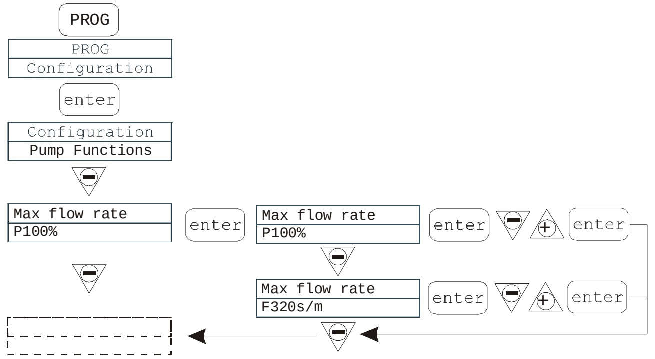

Operating mode
Timer
FLOW sensor status
Programmed value
Quantity in ml
Timer F 7.0 ml
Liv Stop P 0%
Alarms and Level statuses = level alarm
Flow = flow alarm
Pump status
Dry = pump starting up
Stop = pump stopping
Restart = pump restarting
Value of dosing in progress:
Percentage of strokes/min max

Display at start-up (MODE key)


Operating mode
The following are shown in sequence: quantity to dose, delay in d.hh.mm. and interval in d.hh.mm
Q.tà 20,0ml
20,0ml P 100%
Dosing value
Programmed quantity in ml
Value of the dosing percentage, which can be modified by pressing the + or – keys

Paragraph 9 – Setting the Maximum Flow

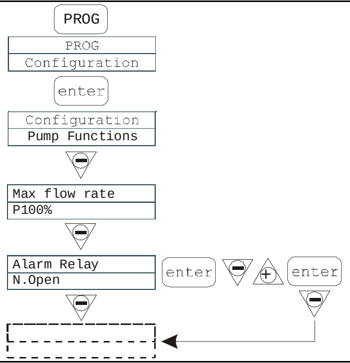
Programming


PROG
PROG
Configuration
enter
Configuration
Pump Functions
Max flow rate
P100%
enter
Max flow rate
P100%
enter
enter
Max flow rate
F320s/m
enter
enter

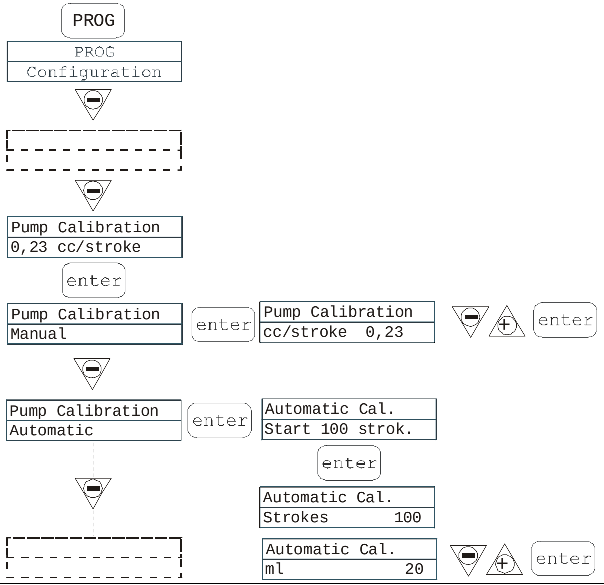
Operation

This makes it possible to set the maximum flow offered by the pump, and the programmed mode (% or frequency) is used as the standard unit of measurement when displaying the flow. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the new value. Press mode enter to confirm and return to the main menu

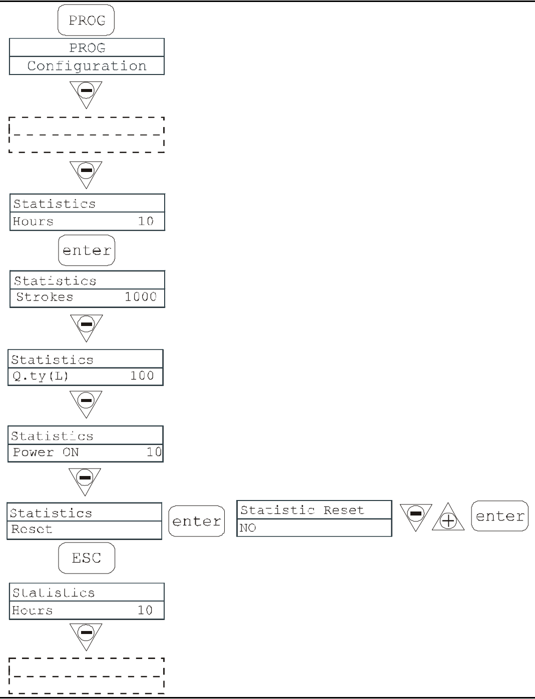
Paragraph 10 – Setting the Alarm Relay

Programming	Operation
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open enter enter	In the absence of an alarm situation, it can be set as open (default) or closed. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the new value. Press mode enter to confirm and return to the main menu

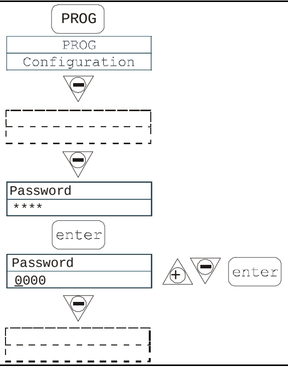
Paragraph 11 – Flow Calibration

Programming	Operation
 PROG PROG Configuration Pump Calibration 0,23 cc/stroke enter Pump Calibration Manual enter Pump Calibration cc/stroke 0,23 enter Pump Calibration Automatic enter Automatic Cal. Start 100 strok. enter Automatic Cal. Strokes 100 Automatic Cal. ml 20 enter	The memorized cc value per strike appears in the main menu. It can be calibrated in two different ways: MANUAL – manually enter the cc value per strike using the ⊕ ⊖ keys and confirm by pressing the mode enter key AUTOMATIC – the pump makes 100 strikes, which are started by pressing the mode enter key. At the end of this process, enter the quantity sucked up by the pump using the ⊕ ⊖ keys and confirm by pressing the mode enter key. The entered figure will be used in flow calculations.

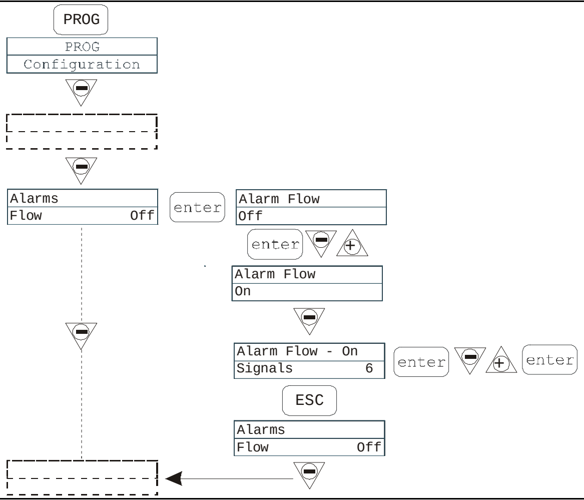
Paragraph 12 - Statistics

Programming	Operation
 PROG PROG Configuration Statistics Hours 10 enter Statistics Strokes 1000 Statistics Q.ty(L) 100 Statistics Power ON 10 Statistics Reset enter Statistic Reset NO enter ESC Statistics Hours 10	The main menu displays the pump operation times. By pressing the mode enter key you can access other statistics: - Strokes = number of strokes made by the pump - Q.ty (L) = quantity dosed by the pump in litres; this figure is calculated on the basis of the memorised cc/stroke value - Power = number of pump starts - Reset = use the ⊕ ⊖ to reset the counters (YES) or otherwise (NO), then confirm by pressing the mode enter key. Pressing the ESC key will take you back to the main menu.

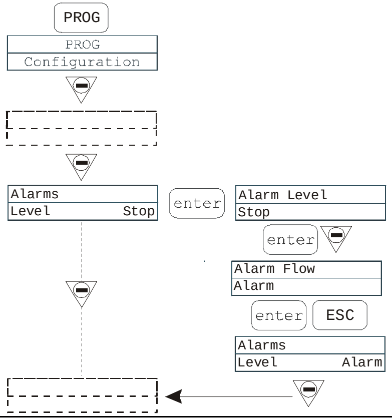
Paragraph 13 – Password

Programming	Operation
 PROG PROG Configuration Password **** enter Password 0000 enter	By entering the password, you can enter the programming menu and see all the set values. The password will be requested whenever you seek to modify them. The flashing line indicates the number than can be modified. Use the ⊕ key to select the number (from 1 to 9), and the ⊖ key to select the number to be modified. Confirm by pressing the mode enter key. By setting “0000” (default), the password is eliminated.

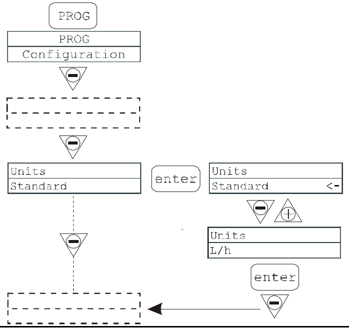
Paragraph 14 – Flow Alarm

Programming	Operation
 PROG PROG Configuration Alarms Flow Off enter Alarm Flow Off enter Alarm Flow On Alarm Flow - On Signals 6 enter enter ESC Alarms Flow Off	This makes it possible to activate (deactivate) the flow sensor. When activated (On), press the ⊖ key to access the request for the number of signals that the pump waits for before an alarm is triggered. The number flashes when you press the mode enter key, and you can then use the ⊕ ⊖ keys to set the value. Confirm by pressing the mode enter key. Press ESC to return to the main menu

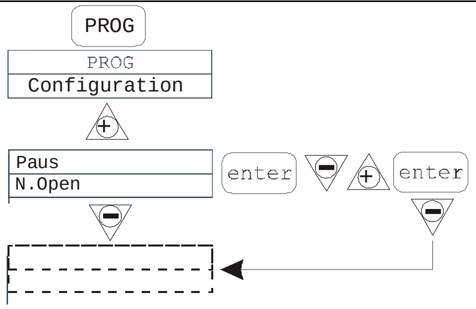
Paragraph 15 – Level Alarm

Programming	Operation
 PROG PROG Configuration Alarms Level Stop enter Alarm Level Stop enter Alarm Flow Alarm enter ESC Alarms Level Alarm	This makes it possible to set the pump when the level sensor alarm is activated. In other words you can decide whether to stop dosage (Stop) or simply activate the alarm signal without stopping dosage. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the alarm type. Confirm by pressing the mode enter key. Press ESC to return to the main menu

Paragraph 16 – Flow Display Unit

Programming	Operation
 PROG PROG Configuration Units Standard enter Units Standard <- Units L/h enter	This makes it possible to set the dosage unit of measurement on the display. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the unit of measurement, choosing between L/h (liters/hour), Gph (Gallons/hour), ml/m (milliliters/minute) or standard (% or frequency, depending on settings). Press mode enter to confirm and return to the main menu

Paragraph 17 - Setting the Pause

Programming	Operation
 PROG PROG Configuration Paus N.Open enter enter	The pump can be paused by remote input. The factory setting is Normally Open. Changes can be made by pressing the mode enter key, then using the ⊕ ⊖ keys to set the new value (N. OPEN or N. CLOSED). Press mode enter to confirm and return to the main menu.

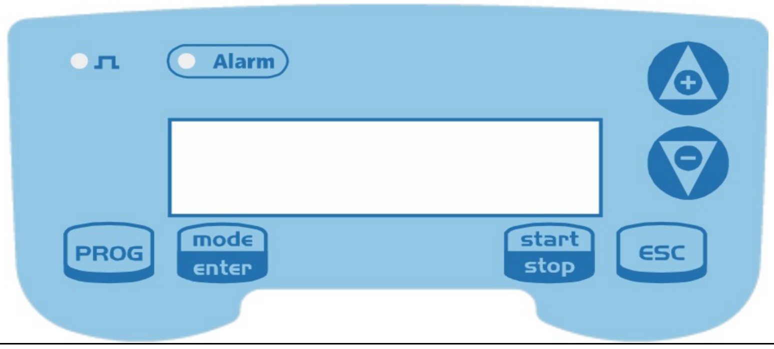
Display contrast adjustment.

For adjusting the display contrast keep the key esc pressed and within 5 seconds press the keys ⊕ or ⊖ to increase or decrease the contrast.

Alarms

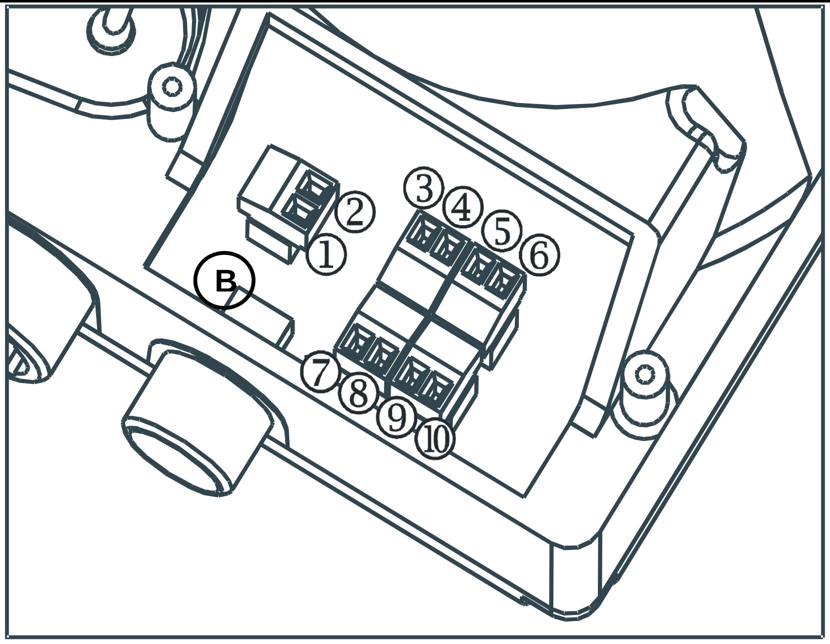
Display	Cause	Interruption
Fixed alarm LED Flashing word “Lev” I.e. Man Lev P100%	End of level alarm, without interrupting pump operation	Restore the liquid level.
Fixed alarm LED Flashing words “Lev” and “stop” I.e. Man Lev Stop P100%	End of level alarm, with interruption to pump operation	Restore the liquid level.
Flashing word “Mem” I.e. 1:n 6 Mem	The pump receives one or more pulses during dosage with memory function on Off	Press the start stop key
Flashing word “Mem” I.e. 1:n M 6 Mem	The pump receives one or more pulses during dosage with memory function on On	When the pump finishes receiving external impulses, it returns the memorized strokes
Fixed alarm LED Flashing word “Flw” I.e. Man F Flw P100%	Active flow alarm. The pump has not received the programmed number of signals from the flow sensor.	Press the start stop key
I.e. Parameter Error PROG to default	Internal CPU communication error.	Press the PROG key to restore the default parameters.

Steuertafel – TEKNA TPG



PROG	Zugriff auf das Programmiermenü
mode enter	Während des Pumpenbetriebs: Durch Drücken werden die programmierten Werte zyklisch auf dem Display angezeigt; bei gleichzeitigem Drücken der Tasten ⊕ ⊖ wird ein Wert, je nach ausgewähltem Betriebsmodus, erhöht bzw. verringert. Während der Programmierung übernimmt diese Taste die Funktion “Enter”, d.h. dass der Zugriff auf die verschiedenen Menüstufen und die dort vorgenommenen Veränderungen bestätigt werden.
start stop	Startet und stoppt die Pumpe. Wenn ein Füllstandsalarm (nur Alarmfunktion), ein Durchflussalarm und ein Memoryalarm aktiv ist, deaktiviert diese Taste die Anzeige auf dem Display.
esc	Zum “Verlassen” der verschiedenen Menüstufen. Vor dem endgültigen Verlassen der Programmierung öffnet sich ein Speicherungsdialog für Veränderungen.
⊕	Blättert nach oben im Menü, oder erhöht die numerischen Werte, die verändert werden sollen. Im Batch-Modus kann diese Taste die Dosierung starten.
⊖	Blättert nach unten im Menü, oder verringert die numerischen Werte, die verändert werden sollen.
⎍ ●	Grüne Led, die während dem Dosiervorgang blinkt.
Alarm ●	Rote Led, die sich bei den verschiedenen Alarmsituationen einschaltet.

Anschlusse Elektrik



1	Relaisausgang (Alarm) Wahlweise Öffner (NC) oder Schliesser (NO)	
2		
3	Pole +	4-20 mA Eingangs-Signal Eingang Widerstand: 200 ohm
4	Pole -	
5	-Eingang Fernbedienung(Start-Stop) -Eingang Pause-signal	
6		
7	-Impuls – Eingang (Impuls – Wasserzähler) -Eingang externes Trigger-signal	
8		
9	Eingang Fluss - Sensor	
10		
B	Eingang Füllstandkontrolle	

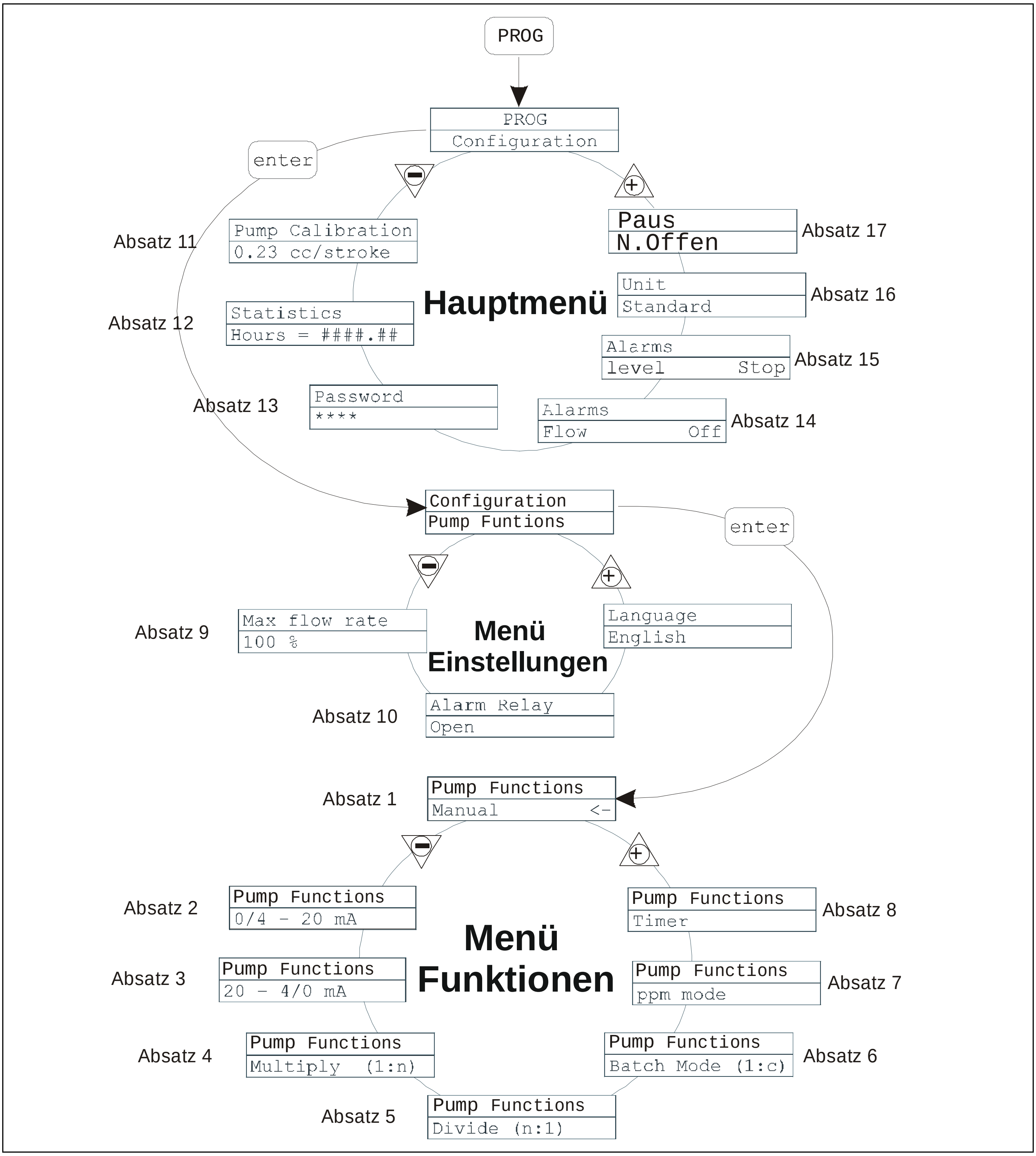
Programmiermenü Tekna TPG

Durch über drei Sekunden langes Drücken der Taste PROG erhalten Sie Zugriff auf die Programmierung. Über die Tasten ⊕ ⊖ können Sie die Menüpunkte durchblättern. Über die Taste mode enter erhalten Sie Zugriff auf die Veränderungen.
Werkseitig ist die Pumpe auf den Konstant-Modus programmiert. Die Pumpe kehrt nach 1 Minute Inaktivität automatisch zum Betriebs-Modus zurück. In diesem Fall werden etwaig eingegebene Daten nicht gespeichert.

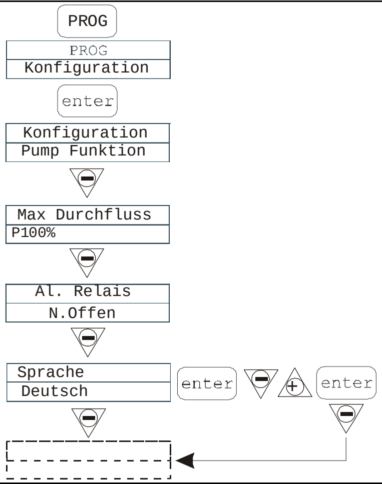
Über die Taste esc verlassen Sie die Programmierstufen. Bei Verlassen der Programmierung wird auf dem Display folgendes angezeigt:

```
Exit                      Exit
   No Save        ∇ Δ        Save
```

mode enter Zur Bestätigung der Auswahl

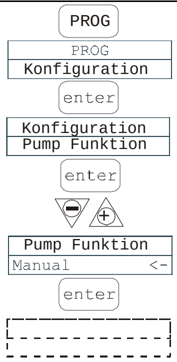

PROG
PROG Configuration
enter
Absatz 11
Pump Calibration 0.23 cc/stroke
Absatz 12
Statistics Hours = ####.##
Absatz 13
Password ****
Paus N.Offen
Absatz 17
Hauptmenü
Unit Standard
Absatz 16
Alarms level Stop
Absatz 15
Alarms Flow Off
Absatz 14
Configuration Pump Funtions
enter
Absatz 9
Max flow rate 100 %
Menü Einstellungen
Language English
Absatz 10
Alarm Relay Open
Absatz 1
Pump Functions Manual <-
Absatz 2
Pump Functions 0/4 - 20 mA
Absatz 3
Pump Functions 20 - 4/0 mA
Absatz 4
Pump Functions Multiply (1:n)
Absatz 5
Pump Functions Divide (n:1)
Menü Funktionen
Pump Functions Timer
Absatz 8
Pump Functions ppm mode
Absatz 7
Pump Functions Batch Mode (1:c)
Absatz 6

Sprachauswahl

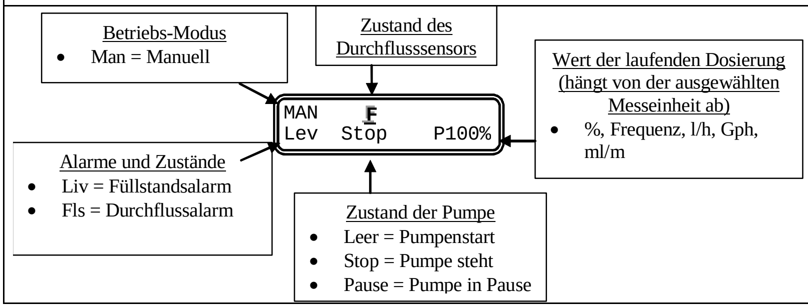
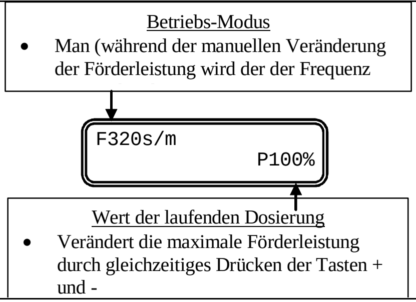
Programmierung	Funktionsweise
	Ermöglicht die Sprachauswahl. Werkseitig ist die Sprache Englisch eingestellt. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein. Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
Max Durchfluss
P100%
Al. Relais
N.Offen
Sprache
Deutsch
enter
enter

Absatz 1 – Manuelle Dosierung

Programmierung	Funktionsweise
	Die Pumpe arbeitet im Konstant-Modus. Die Förderleistung wird manuell geregelt. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird die Förderleistung erhöht bzw. über die Tasten mode enter ⊖ verringert.

PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
Pump Funktion
Manual <-
enter

Anzeige während des Betriebs	Anzeige während der Einstellung (Taste MODE)
	

MAN F
Lev Stop P100%

Betriebs-Modus
- Man = Manuell

Zustand des Durchflusssensors

Wert der laufenden Dosierung (hängt von der ausgewählten Messeinheit ab)
- %, Frequenz, l/h, Gph, ml/m

Alarme und Zustände
- Liv = Füllstandsalarm
- Fls = Durchflussalarm

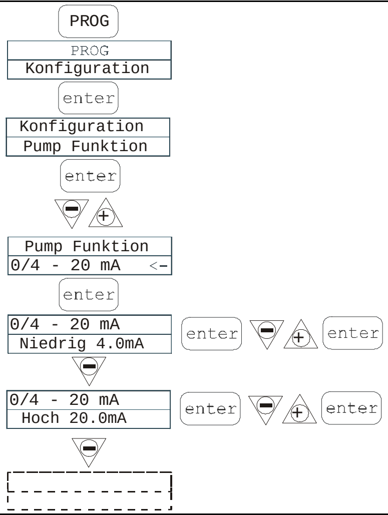
Zustand der Pumpe
- Leer = Pumpenstart
- Stop = Pumpe steht
- Pause = Pumpe in Pause

F320s/m
P100%

Betriebs-Modus
- Man (während der manuellen Veränderung der Förderleistung wird der der Frequenz

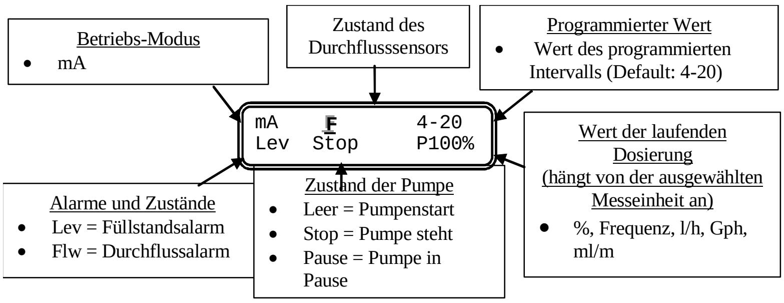
Wert der laufenden Dosierung
- Verändert die maximale Förderleistung durch gleichzeitiges Drücken der Tasten + und -

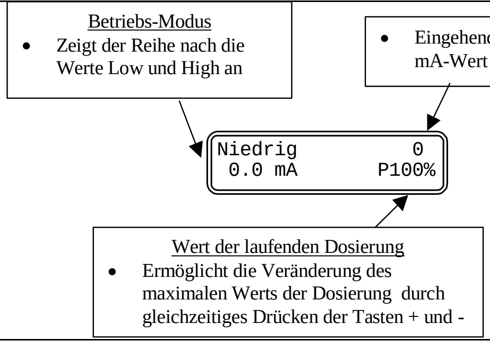
Absatz 2 – Proportionale Dosierung 0/4-20 mA

Programmierung	Funktionsweise
	Die Pumpe dosiert proportional zu einem Signal zwischen (0)4 und 20 mA. Werkseitig ist die Pumpe so eingestellt, dass sie die Dosierung bei 4 mA unterbricht und mit der eingestellten Höchstfrequenz dosiert, wenn sie 20 mA empfängt. Während der Programmierung können diese beiden Werte verändert werden. Die Höchstfrequenz kann während des Betriebs verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird die Förderleistung erhöht bzw. über die Tasten mode enter ⊖ verringert.

PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
Pump Funktion
0/4 - 20 mA <-
enter
0/4 - 20 mA
Niedrig 4.0mA
enter
enter
0/4 - 20 mA
Hoch 20.0mA
enter
enter

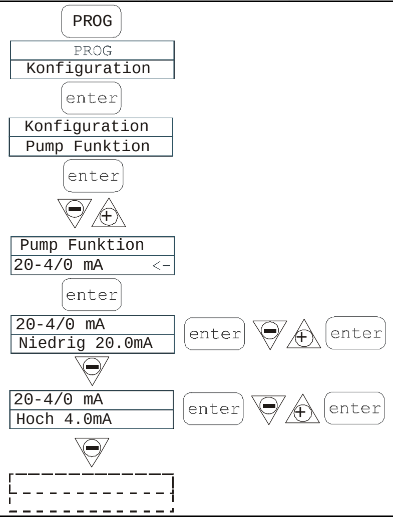
Anzeige während des Betriebs | Anzeige während der Einstellung (Taste MODE)


Betriebs-Modus
• mA
Zustand des Durchflusssensors
Programmierter Wert
• Wert des programmierten Intervalls (Default: 4-20)
mA F 4-20
Lev Stop P100%
Wert der laufenden Dosierung (hängt von der ausgewählten Messeinheit an)
• %, Frequenz, l/h, Gph, ml/m
Alarme und Zustände
• Lev = Füllstandsalarm
• Flw = Durchflussalarm
Zustand der Pumpe
• Leer = Pumpenstart
• Stop = Pumpe steht
• Pause = Pumpe in Pause


Betriebs-Modus
• Zeigt der Reihe nach die Werte Low und High an
• Eingehender mA-Wert
Niedrig 0
0.0 mA P100%
Wert der laufenden Dosierung
• Ermöglicht die Veränderung des maximalen Werts der Dosierung durch gleichzeitiges Drücken der Tasten + und -

Absatz 3 – Proportionale Dosierung 20-4/0 mA

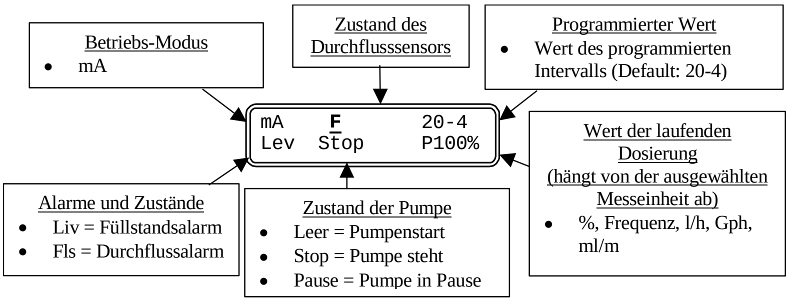
Programmierung

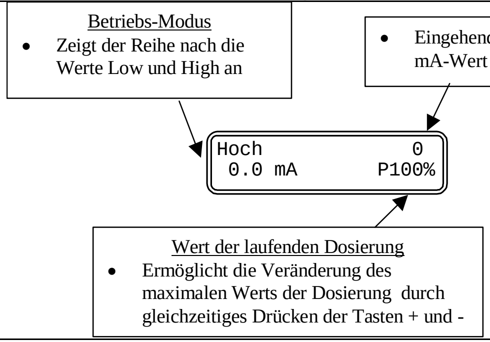

PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
Pump Funktion
20-4/0 mA <-
enter
20-4/0 mA
Niedrig 20.0mA
enter
enter
20-4/0 mA
Hoch 4.0mA
enter
enter

Funktionsweise

Die Pumpe dosiert proportional zu einem Signal zwischen 20 und 4(0) mA. Werkseitig ist die Pumpe so eingestellt, dass sie die Dosierung bei 20 mA unterbricht und mit der eingestellten Höchstfrequenz dosiert, wenn sie 4 mA empfängt. Während der Programmierung können diese beiden Werte verändert werden. Die Höchstfrequenz kann während des Betriebs verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird die Förderleistung erhöht bzw. über die Tasten mode enter ⊖ verringert.

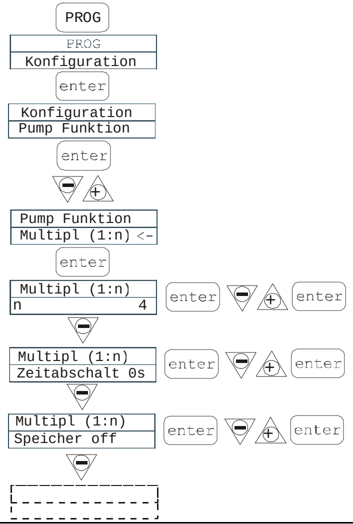
Anzeige während des Betriebs | Anzeige während der Einstellung (Taste MODE)


Betriebs-Modus
• mA
Zustand des Durchflusssensors
Programmierter Wert
• Wert des programmierten Intervalls (Default: 20-4)
mA F 20-4
Lev Stop P100%
Wert der laufenden Dosierung (hängt von der ausgewählten Messeinheit ab)
• %, Frequenz, l/h, Gph, ml/m
Alarme und Zustände
• Liv = Füllstandsalarm
• Fls = Durchflussalarm
Zustand der Pumpe
• Leer = Pumpenstart
• Stop = Pumpe steht
• Pause = Pumpe in Pause


Betriebs-Modus
• Zeigt der Reihe nach die Werte Low und High an
• Eingehender mA-Wert
Hoch 0
0.0 mA P100%
Wert der laufenden Dosierung
• Ermöglicht die Veränderung des maximalen Werts der Dosierung durch gleichzeitiges Drücken der Tasten + und -

Absatz 4 – Proportionale Dosierung mit externen Impulsen (Multiplikation)

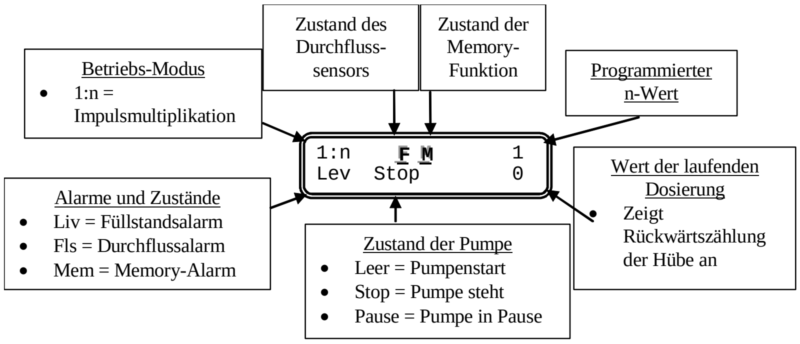
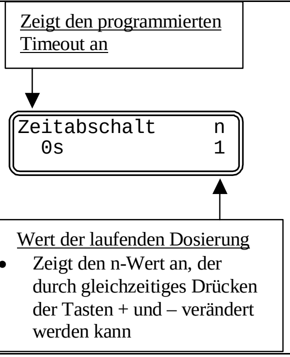
Programmierung


PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
Pump Funktion
Multipl (1:n) <-
enter
Multipl (1:n)
n 4
enter
enter
Multipl (1:n)
Zeitabschalt 0s
enter
enter
Multipl (1:n)
Speicher off
enter
enter

Funktionsweise

Die Pumpe dosiert proportional zu einem externen Signal (z.B.: Wasseruhr mit Impulsgeber). Bei jedem empfangenen Signal führt die Pumpe die programmierten “n“ Hübe aus. Die Pumpe stellt automatisch die Dosierfrequenz ein und passt diese an den Zeitraum an, der zwischen zwei aufeinander folgenden Signalen liegt. Es ist möglich, diesen Zeitraum (Timeout), über den hinaus die Pumpe die Zeitzählung wieder von Null beginnt, in Sekunden zu programmieren, um zu lange Dosierungen zu vermeiden. Die Pumpe verfügt über eine Memory-Funktion, die den Empfang eines Signals während der Dosierung signalisiert. Wenn sie auf OFF gestellt ist, beschränkt sie sich darauf, zu signalisieren. Wenn sie auf ON gestellt ist, signalisiert und speichert sie die Impulse und führt diese aus, wenn sie keine Signale mehr empfängt.

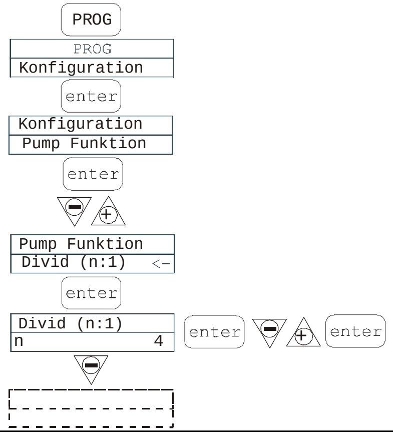
Der Wert “n“ kann während des Betriebs verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird die Förderleistung erhöht bzw. über die Tasten mode enter ⊖ verringert.

Anzeige während des Betriebs	Anzeige während der Einstellung (Taste MODE)
	

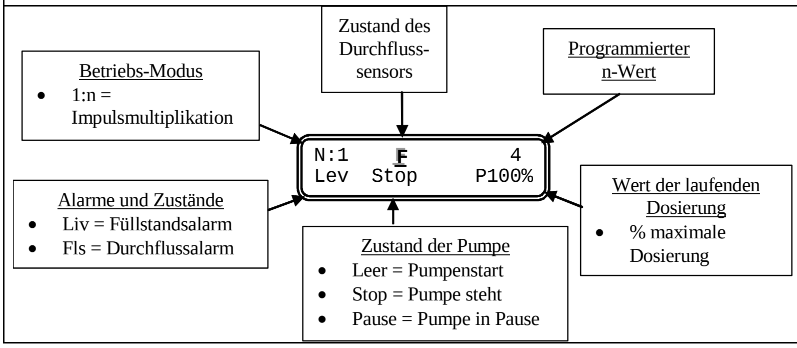
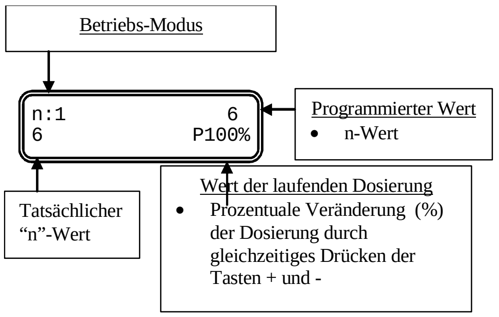
Betriebs-Modus
1:n = Impulsmultiplikation
Zustand des Durchfluss-sensors
Zustand der Memory-Funktion
Programmierter n-Wert
Alarme und Zustände
Liv = Füllstandsalarm
Fls = Durchflussalarm
Mem = Memory-Alarm
1:n F M 1
Lev Stop 0
Wert der laufenden Dosierung
Zeigt Rückwärtszählung der Hübe an
Zustand der Pumpe
Leer = Pumpenstart
Stop = Pumpe steht
Pause = Pumpe in Pause

Zeigt den programmierten Timeout an
Zeitabschalt n
0s 1
Wert der laufenden Dosierung
Zeigt den n-Wert an, der durch gleichzeitiges Drücken der Tasten + und – verändert werden kann

Absatz 5 – Proportionale Dosierung mit externen Impulsen (Division)

Programmierung	Funktionsweise
	Die Pumpe dosiert proportional zu einem externen Signal (z.B.: Wasseruhr mit Impulsgeber). Alle “n“ empfangenen Signale führt die Pumpe einen Hub aus. Geben Sie während der Programmierung den Wert “n“ ein. Durch Programmieren des Werts “n“ wird der maximale prozentuale Anteil (%) der Dosierung eingestellt. Dieser Wert kann während des Betriebs verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird er erhöht bzw. über die Tasten mode enter ⊖ verringert.

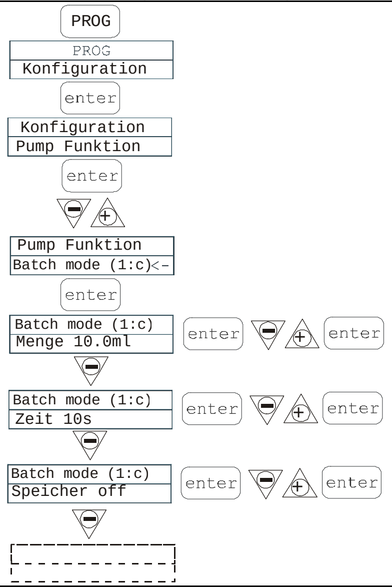
PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
⊖ ⊕
Pump Funktion
Divid (n:1) <-
enter
Divid (n:1)
n 4
enter ⊖ ⊕ enter
⊖

Anzeige während des Betriebs	Anzeige während der Einstellung (Taste MODE)
	

Betriebs-Modus
1:n = Impulsmultiplikation
Zustand des Durchfluss-sensors
Programmierter n-Wert
Alarme und Zustände
Liv = Füllstandsalarm
Fls = Durchflussalarm
N:1 F 4
Lev Stop P100%
Wert der laufenden Dosierung
% maximale Dosierung
Zustand der Pumpe
Leer = Pumpenstart
Stop = Pumpe steht
Pause = Pumpe in Pause

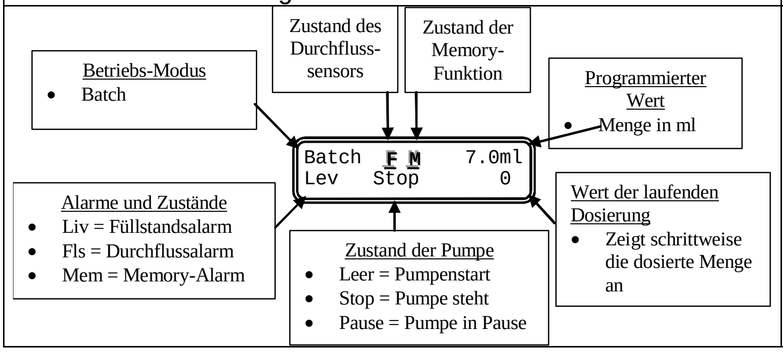
Betriebs-Modus
n:1 6
6 P100%
Programmierter Wert
n-Wert
Tatsächlicher “n”-Wert
Wert der laufenden Dosierung
Prozentuale Veränderung (%) der Dosierung durch gleichzeitiges Drücken der Tasten + und -

Absatz 6 – Proportionale Dosierung mit externen Impulsen (Batch-Dosierung)

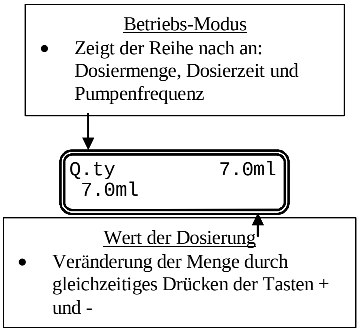
Programmierung	Funktionsweise
	Die Pumpe dosiert proportional zu einem externen Signal (z.B.: Wasseruhr mit Impulsgeber). In diesem Fall kann die Menge, die dosiert werden soll, in ml und die Zeit, in der die Dosierung durchgeführt werden soll, programmiert werden. Die Dosierung kann durch Drücken der Taste ⊕ oder über eine Fernsteuerung manuell gestartet werden. Die Taste start stop unterbricht die Dosierung. Diese kann daraufhin durch Drücken der Taste ⊕ auf Null gestellt oder durch erneutes Drücken von start stop wieder gestartet werden. Die Dosiermenge kann während des Betriebs verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter ⊕ wird die Förderleistung erhöht bzw. über die Tasten mode enter ⊖ verringert.

PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
⊖ ⊕
Pump Funktion
Batch mode (1:c)<-
enter
Batch mode (1:c)
Menge 10.0ml
enter ⊖ ⊕ enter
⊖
Batch mode (1:c)
Zeit 10s
enter ⊖ ⊕ enter
⊖
Batch mode (1:c)
Speicher off
enter ⊖ ⊕ enter
⊖

Anzeige während des Betriebs

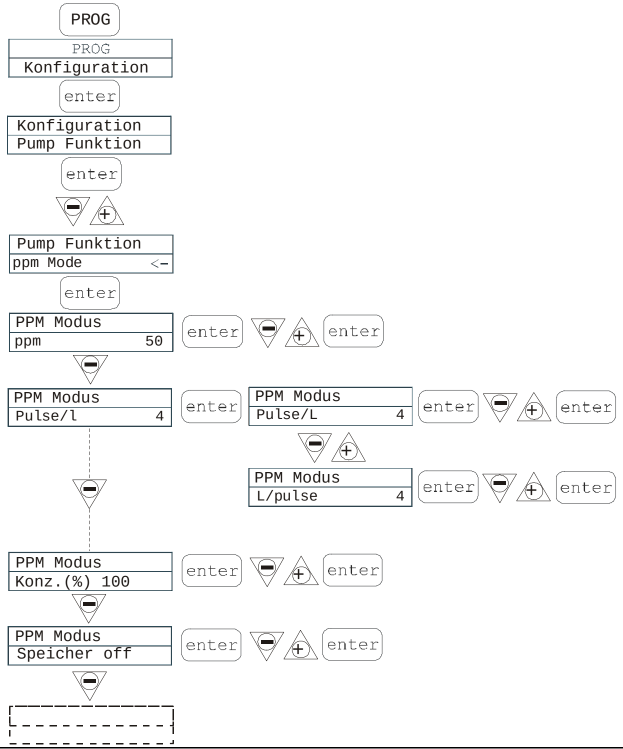

Betriebs-Modus
Batch
Zustand des Durchfluss-sensors
Zustand der Memory-Funktion
Programmierter Wert
Menge in ml
Batch F M 7.0ml
Lev Stop 0
Alarme und Zustände
Liv = Füllstandsalarm
Fls = Durchflussalarm
Mem = Memory-Alarm
Zustand der Pumpe
Leer = Pumpenstart
Stop = Pumpe steht
Pause = Pumpe in Pause
Wert der laufenden Dosierung
Zeigt schrittweise die dosierte Menge an

Anzeige während der Einstellung (Taste MODE)


Betriebs-Modus
Zeigt der Reihe nach an: Dosiermenge, Dosierzeit und Pumpenfrequenz
Q.ty 7.0ml
7.0ml
Wert der Dosierung
Veränderung der Menge durch gleichzeitiges Drücken der Tasten + und -

Absatz 7 – Proportionale Dosierung mit externen Impulsen (PPM-Dosierung)

Programmierung


PROG
PROG
Konfiguration
enter
Konfiguration
Pump Funktion
enter
Pump Funktion
ppm Mode <-
enter
PPM Modus
ppm 50
enter
enter
PPM Modus
Pulse/l 4
enter
PPM Modus
Pulse/L 4
enter
enter
PPM Modus
L/pulse 4
enter
enter
PPM Modus
Konz.(%) 100
enter
enter
PPM Modus
Speicher off
enter
enter

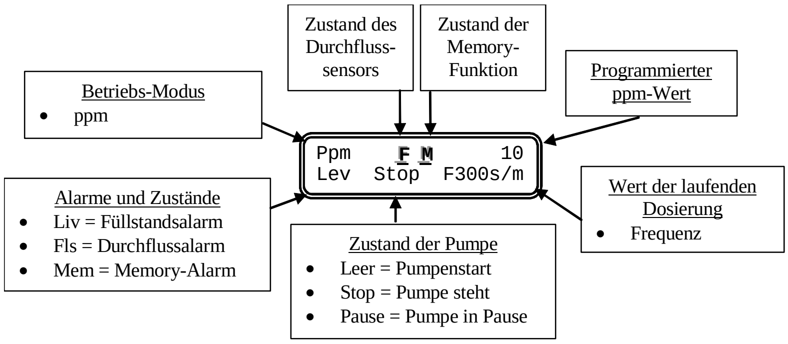
Funktionsweise

Die Pumpe dosiert proportional zu einem externen Signal (z.B.: Wasseruhr mit Impulsgeber), wobei automatisch das Verhältnis zwischen den Eingangssignalen und den Pumpenhüben entsprechend des programmierten ppm-Werts berechnet wird.

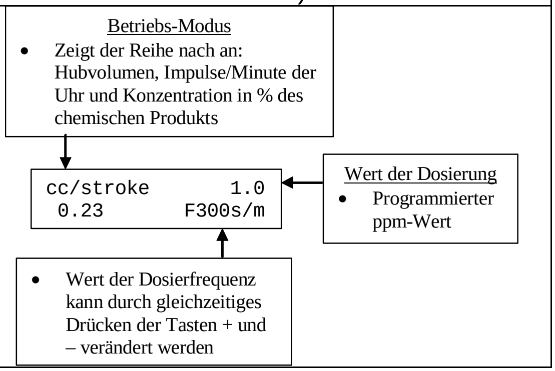
Die einzugebenden Daten sind der ppm-Wert, das Verhältnis Impulse/Liter (bzw. Liter/Impulse) der Wasseruhr und die Konzentration des Produkts, das dosiert werden soll.

Während des Betriebs kann die Dosierfrequenz verändert werden. Durch gleichzeitiges Drücken der Tasten mode enter + wird sie erhöht bzw. über die Tasten mode enter − verringert.

Anzeige während des Betriebs

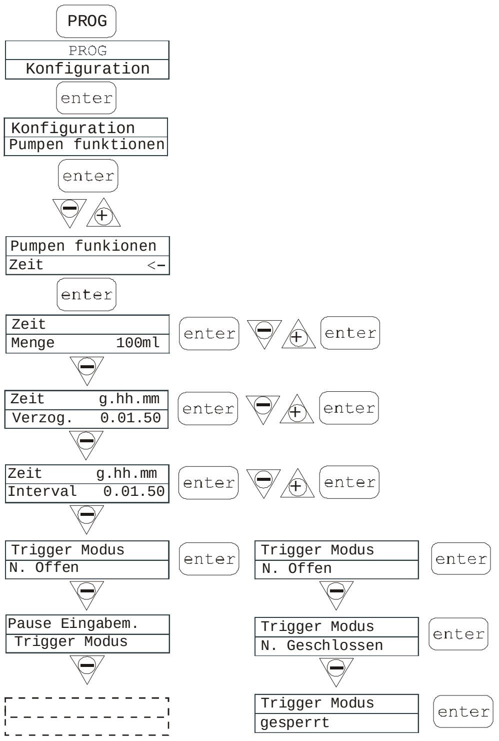

Zustand des Durchfluss-sensors
Zustand der Memory-Funktion
Betriebs-Modus
ppm
Programmierter ppm-Wert
Ppm F M 10
Lev Stop F300s/m
Alarme und Zustände
Liv = Füllstandsalarm
Fls = Durchflussalarm
Mem = Memory-Alarm
Zustand der Pumpe
Leer = Pumpenstart
Stop = Pumpe steht
Pause = Pumpe in Pause
Wert der laufenden Dosierung
Frequenz

Anzeige während der Einstellung (Taste MODE)


Betriebs-Modus
Zeigt der Reihe nach an: Hubvolumen, Impulse/Minute der Uhr und Konzentration in % des chemischen Produkts
cc/stroke 1.0
0.23 F300s/m
Wert der Dosierung
Programmierter ppm-Wert
Wert der Dosierfrequenz kann durch gleichzeitiges Drücken der Tasten + und – verändert werden

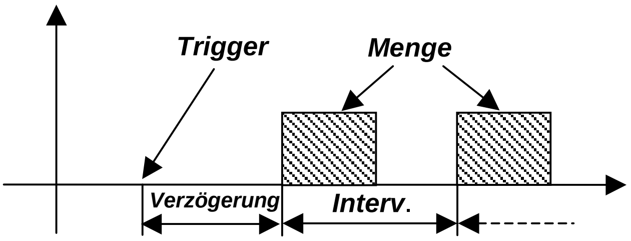
Absatz 8 – Getaktete Dosierung **(Eingang Frequenzsignal “TRIGGER” aktiviert)**

Programmazione

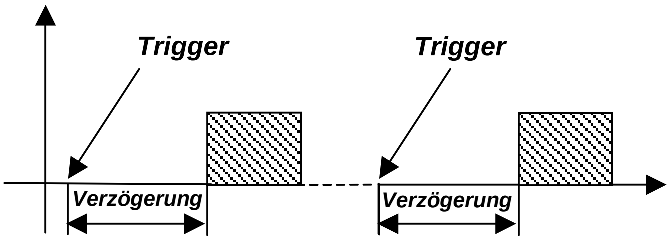

PROG
PROG
Konfiguration
enter
Konfiguration
Pumpen funktionen
enter
Pumpen funkionen
Zeit <-
enter
Zeit
Menge 100ml
enter
enter
Zeit g.hh.mm
Verzog. 0.01.50
enter
enter
Zeit g.hh.mm
Interval 0.01.50
enter
enter
Trigger Modus
N. Offen
enter
Trigger Modus
N. Offen
enter
Pause Eingabem.
Trigger Modus
Trigger Modus
N. Geschlossen
enter
Trigger Modus
gesperrt
enter

Funzionamento

Nach Empfang des eingestellten ***TRIGGER***-Signals dosiert die Pumpe eine in ml programmierbare Menge. Es kann eine Verzögerungszeit vor der Dosierung (***Verzögerung***) und der Zeitabstand zwischen aufeinander folgenden Dosierungen (***Pause***) eingestellt werden, wie im Schema gezeigt:


Trigger
Menge
Verzögerung
Interv.

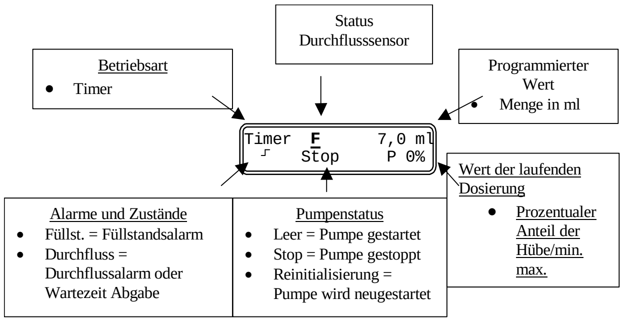
Wird zum Beispiel eine Zeit ***Pause*** = 0 eingegeben, erhält man ein System, bei dem die programmierte Menge nach jedem ***TRIGGER*** -Signal dosiert wird (mit der etwaig eingestellten Verzögerung):


Trigger
Trigger
Verzögerung
Verzögerung

Es ist auch möglich, die Dosierung durch Drücken der Taste + zu starten, die praktisch das ***Trigger***-Signal nachahmt.
Das ***Trigger***-Signal kann auf ***N.Offen*** eingestellt werden (es aktiviert sich, wenn der Eingang von der Betriebsart geöffnet zur Betriebsart geschlossen übergeht), oder auf ***N. Geschlossen*** (es aktiviert sich, wenn der Eingang von der Betriebsart geschlossen zur Betriebsart geöffnet übergeht).
Das ***Trigger***-Signal ist während der Dosierung blockiert (sein Empfang wird weder gespeichert, noch verwaltet).
Der Eingang ***Pause*** (***Eingang Fernbedienung***) kann nicht programmiert werden und seine Aktivierung blockiert die Dosierung, während die nachfolgende Deaktivierung das System wieder in den Zustand Warten auf das ***Trigger***-Signal für eine neue Dosierung versetzt.

Während des Pumpenbetriebs kann die Dosierfrequenz verändert werden, indem gleichzeitig die Tasten mode enter ⊕ gedrückt werden, um die Frequenz zu erhöhen bzw. die Tasten mode enter ⊖, um sie zu verringern.

Anzeige während des Betriebs


Timer F 7,0 ml
Stop P 0%

Status
Durchflusssensor

Betriebsart
- Timer

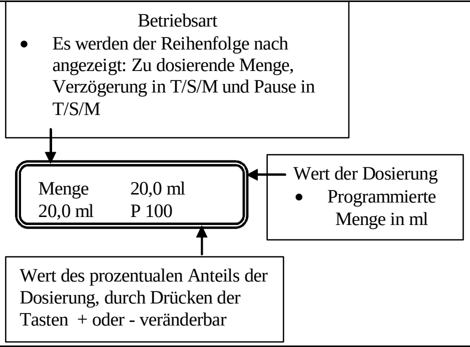
Programmierter Wert
- Menge in ml

Wert der laufenden Dosierung
- Prozentualer Anteil der Hübe/min. max.

Alarme und Zustände
- Füllst. = Füllstandsalarm
- Durchfluss = Durchflussalarm oder Wartezeit Abgabe

Pumpenstatus
- Leer = Pumpe gestartet
- Stop = Pumpe gestoppt
- Reinitialisierung = Pumpe wird neugestartet

Anzeige während der Einstellung (Taste MODE)


Menge 20,0 ml
20,0 ml P 100

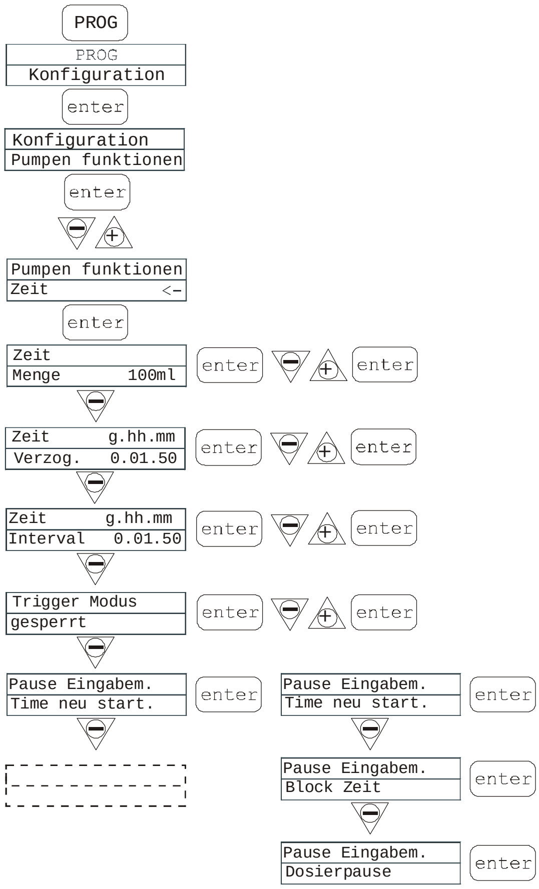
Betriebsart
- Es werden der Reihenfolge nach angezeigt: Zu dosierende Menge, Verzögerung in T/S/M und Pause in T/S/M

Wert der Dosierung
- Programmierte Menge in ml

Wert des prozentualen Anteils der Dosierung, durch Drücken der Tasten + oder - veränderbar

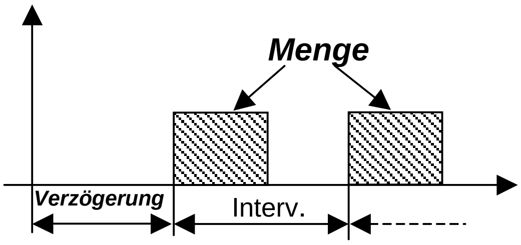
Absatz 8 – Getaktete Dosierung **(Eingang Frequenzsignal “TRIGGER” nicht aktiviert)**

Programmazione


PROG
PROG
Konfiguration
enter
Konfiguration
Pumpen funktionen
enter
Pumpen funktionen
Zeit <-
enter
Zeit
Menge 100ml
Zeit g.hh.mm
Verzog. 0.01.50
Zeit g.hh.mm
Interval 0.01.50
Trigger Modus
gesperrt
Pause Eingabem.
Time neu start.
Pause Eingabem.
Block Zeit
Pause Eingabem.
Dosierpause

Funzionamento

Die Pumpe dosiert eine in ml programmierbare Menge. Es kann eine Startverzögerung der Pumpe (***Verzögerung***) und der Zeitabstand zwischen zwei aufeinander folgenden Dosierungen (***Pause***) eingestellt werden, wie im Schema gezeigt:


Menge
Verzögerung
Interv.

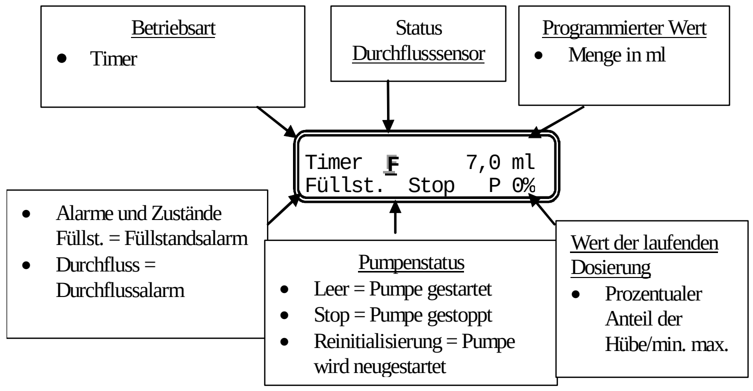
Die ***Verzögerungs***- und ***Pausenzeiten*** sind in T/S/M (Tage, Stunden, Minuten) angegeben.

Der ***Pausen***-Eingang kann auf drei unterschiedliche Arten programmiert werden:

1. ***Blocki Zeit:*** Bei aktivierter Pause blockiert das System die Zählung der aktuellen Zeit und nimmt sie wieder auf, wenn die Pause deaktiviert wird.
2. ***Dosierpause:*** Bei aktivierter Pause zählt das System die Zeit weiter und blockiert die Dosierung.
3. ***Time neu start.:*** Bei aktivierter Pause blockiert das System die Dosierung und startet die Zählung neu, wenn die Pause deaktiviert wird.

Während des Pumpenbetriebs kann die Dosierfrequenz verändert werden, indem gleichzeitig die Tasten mode enter ⊕ gedrückt werden, um die Frequenz zu erhöhen bzw. die Tasten mode enter ⊖, um sie zu verringern.

Anzeige während des Betriebs


Timer F 7,0 ml
Füllst. Stop P 0%

Betriebsart
- Timer

Status Durchflusssensor

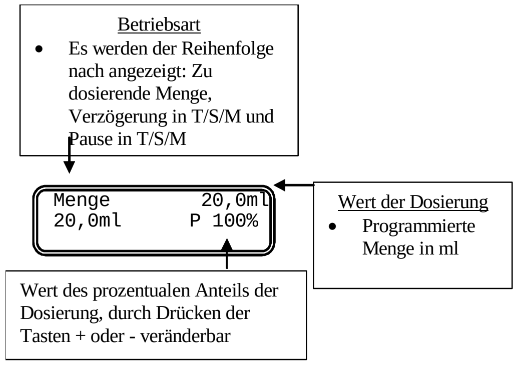
Programmierter Wert
- Menge in ml

- Alarme und Zustände Füllst. = Füllstandsalarm
- Durchfluss = Durchflussalarm

Pumpenstatus
- Leer = Pumpe gestartet
- Stop = Pumpe gestoppt
- Reinitialisierung = Pumpe wird neugestartet

Wert der laufenden Dosierung
- Prozentualer Anteil der Hübe/min. max.

Anzeige während der Einstellung (Taste MODE)


Menge 20,0ml
20,0ml P 100%

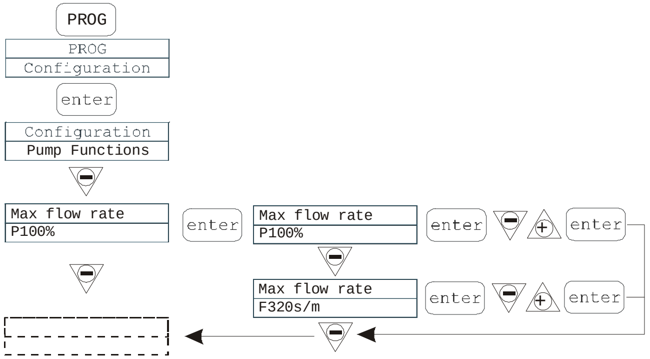
Betriebsart
- Es werden der Reihenfolge nach angezeigt: Zu dosierende Menge, Verzögerung in T/S/M und Pause in T/S/M

Wert der Dosierung
- Programmierte Menge in ml

Wert des prozentualen Anteils der Dosierung, durch Drücken der Tasten + oder - veränderbar

Absatz 9 – Einstellung der maximalen Förderleistung

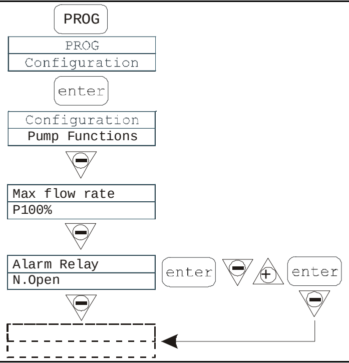
Programmierung


PROG
PROG
Configuration
enter
Configuration
Pump Functions
Max flow rate
P100%
enter
Max flow rate
P100%
Max flow rate
F320s/m

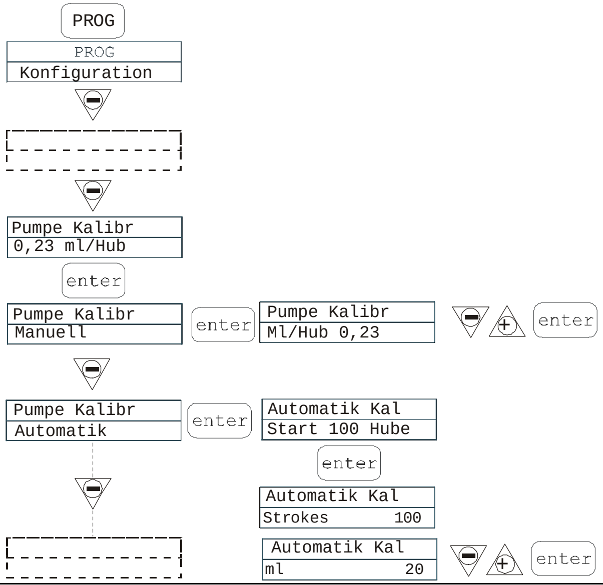
Funktionsweise

Ermöglicht die Einstellung der maximalen Förderleistung, die die Pumpe erreichen kann, und der programmierte Betriebs-Modus (% oder Frequenz) wird zur Anzeige der Förderleistung in der Standardmesseinheit. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein. Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

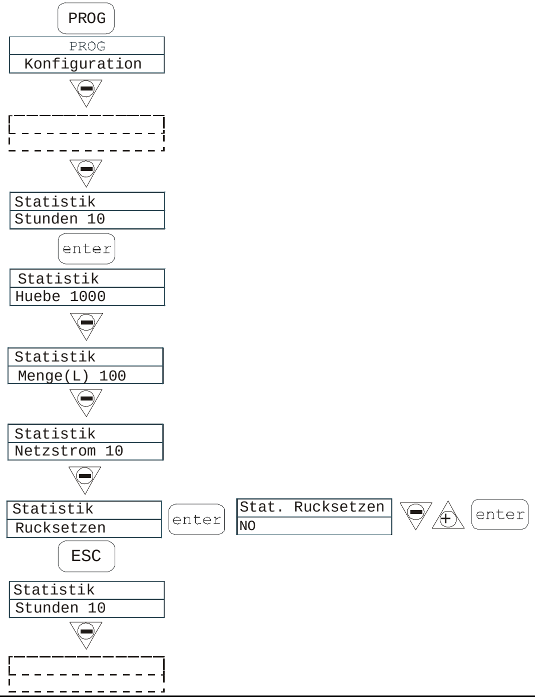
Absatz 10 – Einstellung Alarmrelais

Programmierung	Funktionsweise
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open enter enter	Wenn keine Alarmsituation vorliegt, kann es auf geöffnet (werkseitige Einstellung) oder geschlossen gestellt werden. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein. Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

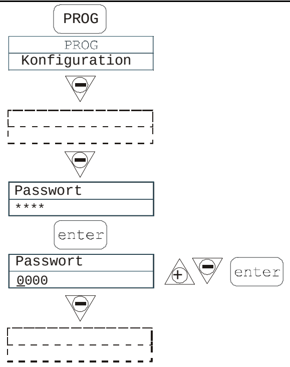
Absatz 11 – Kalibrierung der Förderleistung

Programmierung	Funktionsweise
 PROG PROG Konfiguration Pumpe Kalibr 0,23 ml/Hub enter Pumpe Kalibr Manuell enter Pumpe Kalibr Ml/Hub 0,23 enter Pumpe Kalibr Automatik enter Automatik Kal Start 100 Hube enter Automatik Kal Strokes 100 Automatik Kal ml 20 enter	Im Hauptmenü erscheint das gespeicherte Hubvolumen. Es kann auf zwei Arten kalibriert werden: MANUELL – Geben Sie über die Tasten ⊕ ⊖ manuell das Hubvolumen ein und bestätigen Sie über mode enter AUTOMATISCH – Die Pumpe führt 100 Hübe aus, die über die Taste gestartet und über mode enter bestätigt werden. Wenn diese Hübe ausgeführt worden sind, geben Sie über die Tasten ⊕ ⊖ die von der Pumpe angesaugte Menge ein und bestätigen Sie über mode enter. Der eingegebene Wert wird bei der Berechnung der Förderleistungen verwendet.

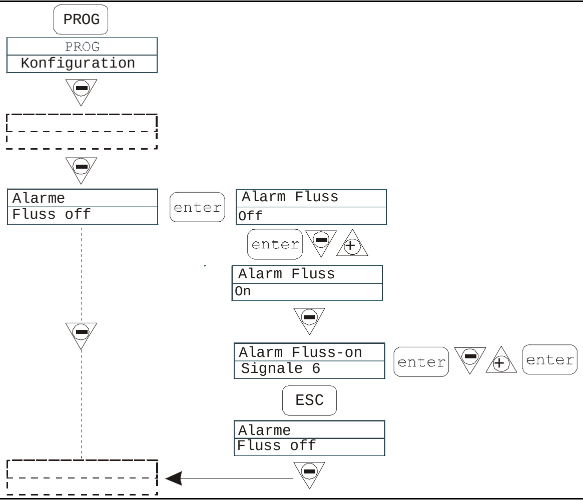
Absatz 12 – Statistiken

Programmierung	Funktionsweise
 PROG PROG Konfiguration Statistik Stunden 10 enter Statistik Huebe 1000 Statistik Menge(L) 100 Statistik Netzstrom 10 Statistik Rucksetzen enter Stat. Rucksetzen NO enter ESC Statistik Stunden 10	Im Hauptmenü werden die Betriebsstunden der Pumpe angezeigt. Durch Drücken der Taste mode enter erhalten Sie Zugriff auf die anderen Statistiken: - Strokes = Anzahl der von der Pumpe ausgeführten Hübe - Q.ty(L) = in Litern ausgedrückte von der Pumpe dosierte Menge; dieser Wert wird entsprechend des gespeicherten Hubvolumens berechnet. - Power = Anzahl der Pumpenstarts - Reset = über die Tasten ⊕ ⊖ können Sie wählen, ob Sie die Uhr auf Null stellen möchten (YES) oder nicht (NO), über mode enter bestätigen Sie. Durch Drücken von ESC gelangen Sie zum Hauptmenü zurück.

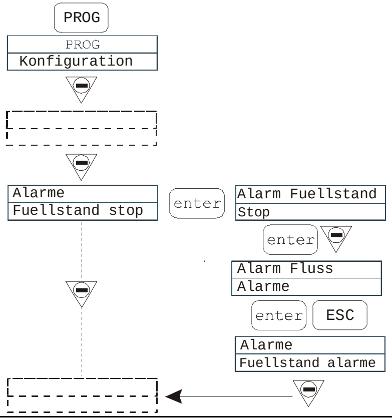
Absatz 13 – Passwort

Programmierung	Funktionsweise
 PROG PROG Konfiguration Passwort **** enter Passwort 0000 enter	Durch Eingabe des Passworts erhalten Sie Zugriff auf die Programmierung und können sich alle eingegebenen Werte ansehen. Jedes Mal wenn Sie versuchen, diese Werte zu verändern, erscheint ein eigener Passwortdialog. Die blinkende Linie zeigt die veränderbare Nummer an. Wählen Sie über die Taste ⊕ die Nummer aus (zwischen 1 und 9), wählen Sie über die Taste ⊖ die Nummer aus, die verändert werden soll, und bestätigen Sie anschließend über mode enter. Durch Eingabe von “0000” (werkseitige Einstellung) wird die Passwortabfrage übersprungen.

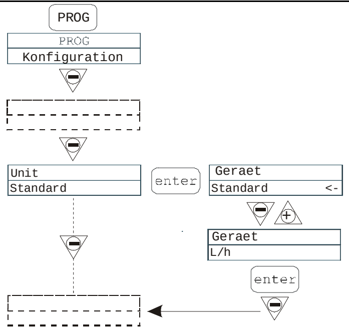
Absatz 14 – Durchflussalarm

Programmierung	Funktionsweise
 PROG PROG Konfiguration Alarme Fluss off enter Alarm Fluss Off enter Alarm Fluss On Alarm Fluss-on Signale 6 enter enter ESC Alarme Fluss off	Ermöglicht die Aktivierung (Deaktivierung) des Durchflusssensors. Wenn er einmal aktiviert ist (ON), erhalten Sie durch Drücken der Taste ⊖ Zugriff auf den Abfragedialog, wie viele Signale die Pumpe abwartet, bevor Sie einen Alarm auslöst. Durch Drücken von mode enter beginnt die Nummer zu blinken. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein. Über mode enter bestätigen Sie. Durch Drücken von esc werden Sie zum Hauptmenü zurückgeleitet.

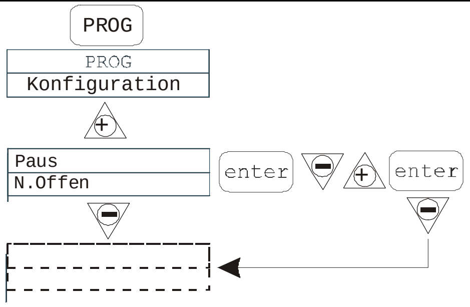
Absatz 15 – Füllstandsalarm

Programmierung	Funktionsweise
 PROG PROG Konfiguration Alarme Fuellstand stop enter Alarm Fuellstand Stop enter Alarm Fluss Alarme enter ESC Alarme Fuellstand alarme	Ermöglicht die Einstellung des Zeitpunkts, an dem der Füllstandsalarm aktiviert wird, also auch ob die Dosierung blockiert (Stop), oder einfach nur das Alarmsignal aktiviert werden soll, ohne dabei die Dosierung zu blockieren. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ die Alarmart ein. Über mode enter bestätigen Sie. Durch Drücken von esc werden Sie zum Hauptmenü zurückgeleitet.

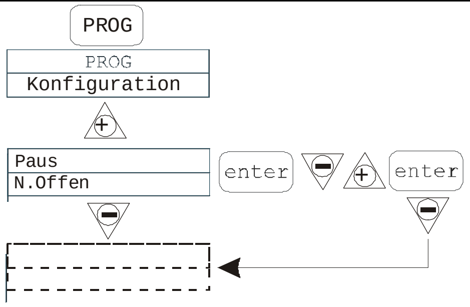
Absatz 16 – Anzeigeeinheit der Förderleistung

Programmierung	Funktionsweise
 PROG PROG Konfiguration Unit Standard enter Geraet Standard <- Geraet L/h enter	Ermöglicht die Einstellung der Maßeinheit der Dosierung über eine Anzeige auf dem Display. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ die gewünschte Maßeinheit ein, L/H (Liter/Stunde), GpH (Gallone/Stunde), ml/m (Milliliter/Minute) oder die Standardeinstellung (% oder Frequenz, je nach Einstellung). Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

Absatz 16 - Einstellung Pause

Programmierung	Funktionsweise
 PROG PROG Konfiguration Paus N.Offen enter enter	Steuereingang: Pumpe Stop / Start. Werkseinstellung: Bei Schließerkontakt (elektrisch leitende Verbindung zwischen beiden Anschlussklemmen) Pumpenstop. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein (N. OFFEN oder N. GESCHLOSSEN). Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

Absatz 17 - Einstellung Pause

Programmierung	Funktionsweise
 PROG PROG Konfiguration Paus N.Offen enter enter	Steuereingang: Pumpe Stop / Start. Werkseinstellung: Bei Schließerkontakt (elektrisch leitende Verbindung zwischen beiden Anschlussklemmen) Pumpenstop. Durch Drücken von mode enter erhalten Sie Zugriff auf die Veränderung. Stellen Sie dann über die Tasten ⊕ ⊖ den Wert ein (N. OFFEN oder N. GESCHLOSSEN). Über mode enter bestätigen Sie und werden zum Hauptmenü zurückgeleitet.

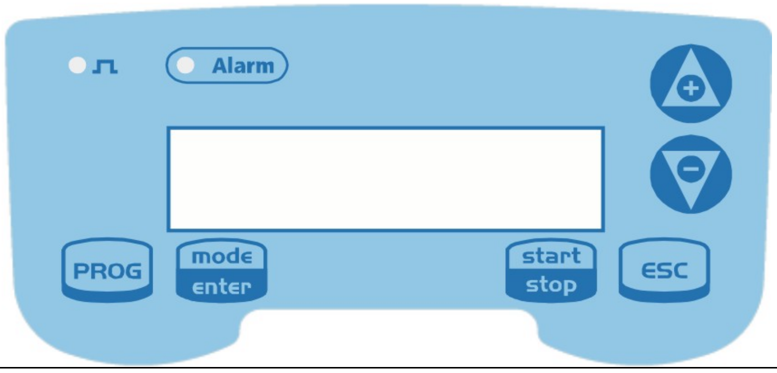
Display - Einstellung Kontrast

Für die Einstellung des Display-Kontrasts wird die esc Taste festgedrückt und innerhalb von 5 Sekunden mit den Tasten ⊕ oder ⊖ der gewünschte Kontrast festgelegt

Alarme

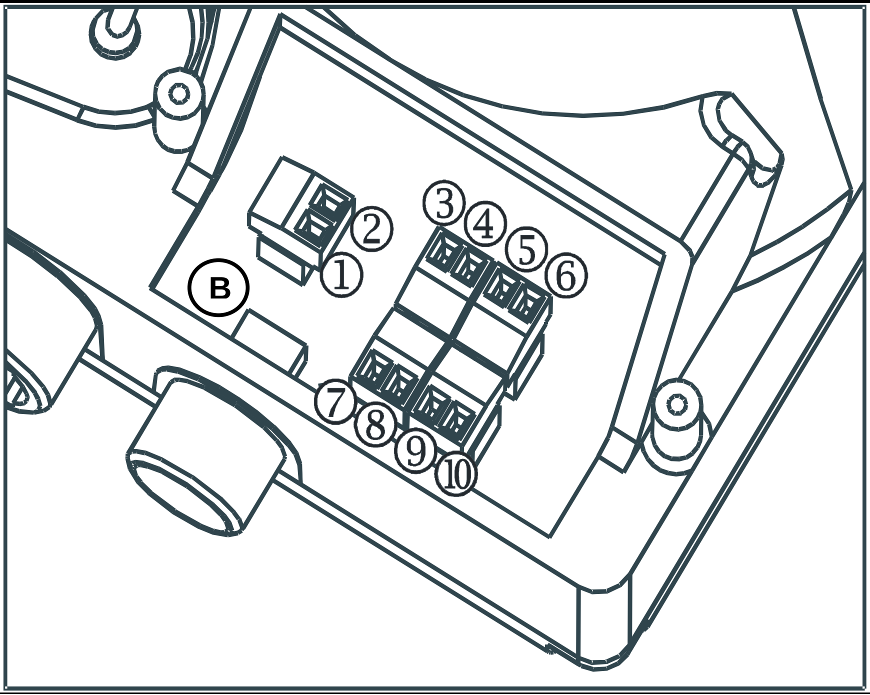
Anzeige	Ursache	Unterbrechung
Alarm-Led leuchtet kontinuierlich Der Schriftzug Lev blinkt Bsp. `Man` `Lev P100%`	Alarm Füllstand nicht ausreichend, ohne Unterbrechung des Pumpenbetriebs	Flüssigkeit nachfüllen
Alarm-Led leuchtet kontinuierlich Der Schriftzug Lev und Stop blinkt Bsp. `Man` `Lev Stop P100%`	Alarm Füllstand nicht ausreichend, mit Unterbrechung des Pumpenbetriebs	Flüssigkeit nachfüllen
Der Schriftzug Mem blinkt Bsp. `1:n 6` `Mem`	Die Pumpe empfängt einen oder mehrere Impulse während der Dosierung mit Memory-Funktion in Off-Stellung	Die Taste start stop drücken
Der Schriftzug Mem blinkt Bsp. `1:n M 6` `Mem`	Die Pumpe empfängt einen oder mehrere Impulse während der Dosierung mit Memory-Funktion in On-Stellung	Wenn die Pumpe keine externen Impulse mehr empfängt, führt sie die gespeicherten Hübe aus
Alarm-Led leuchtet kontinuierlich Der Schriftzug Flw blinkt Bsp. `Man F` `Flw P100%`	Durchflussalarm aktiv, die Pumpe hat nicht die programmierten Signale vom Durchflusssensor empfangen.	Die Taste start stop drücken
Bsp. `Parameter Error` `PROG to default`	Interner Kommunikationsfehler der CPU.	Die Taste PROG drücken, um auf die Default-Parameter rückzustellen.

Panel de control – TEKNA TPG



PROG	Acceso al menú de programación.
mode enter	Durante el funcionamiento de la bomba: Si se pulsa visualiza cíclicamente en el display los valores programados; si se pulsa simultáneamente a las teclas ⊕ ⊖ aumenta o disminuye un valor dependiente del modo de funcionamiento escogido. En programación ejerce la función “enter”, es decir, confirma la entrada de los diferentes niveles del menú y las modificaciones en el interior de los mismos.
start stop	Pone en marcha y detiene la bomba. En condiciones de alarma de nivel (sólo función de alarma), de alarma de flujo y alarma *memory* activas, desactiva la señalización en el display.
ESC	Para “salir” de los diferentes niveles del menú. Antes de salir definitivamente de la programación se accede a la solicitud de memorización de las modificaciones.
⊕	Desplaza los menús hacia arriba o aumenta los valores numéricos a modificar. En modo Batch puede poner en marcha la dosificación.
⊖	Desplaza los menús hacia abajo o disminuye los valores numéricos a modificar.
⎍ ○	Led verde parpadeante durante la dosificación.
Alarm ○	Led rojo que se enciende durante las diferentes situaciones de alarma.

Conexiones eléctricas



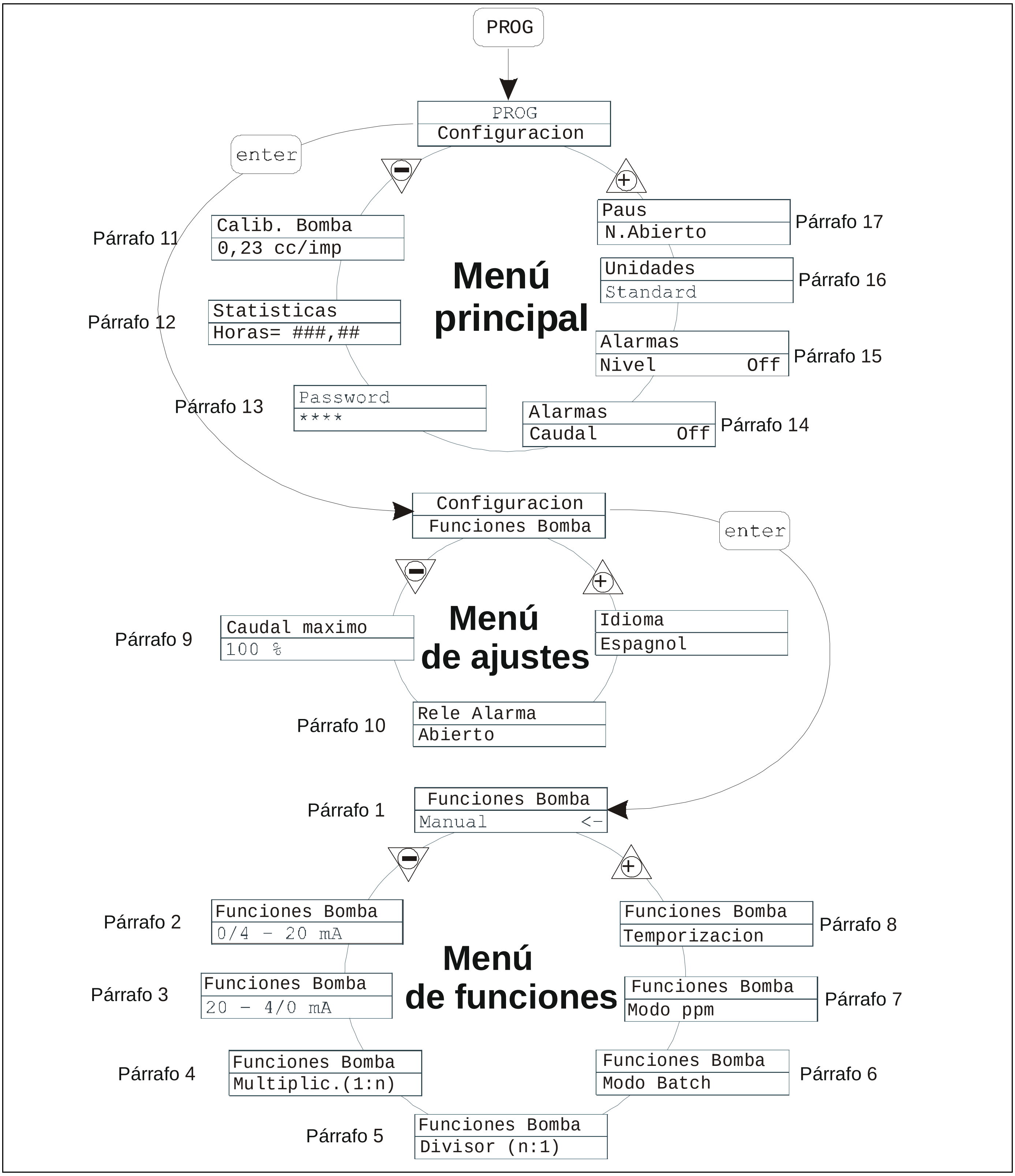
1	Relé de Alarma	
2		
3	Pole +	Entrada señal 4-20 mA Impedancia De Entrada: 200 ohm
4	Pole -	
5	-Entrada control externo (start-stop) -Entrada señal de pausa	
6		
7	-Entrada señal en frecuencia (contador emisor de impulsos) -Entrada trigger externo	
8		
9	Entrada sensor de Flujo	
10		
B	Entrada sonda de nivel	

Menú de programación Tekna TPG

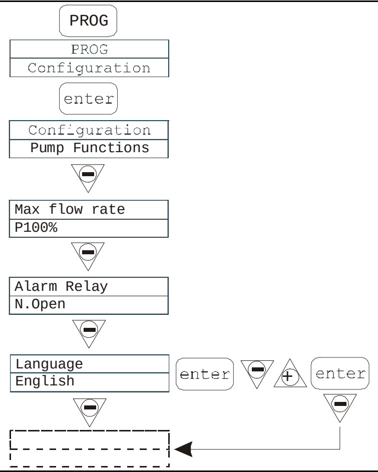
Pulsando la tecla PROG durante más de tres segundos se accede a la programación. Con las teclas △ ▽ se pueden desplazar las voces del menú, con la tecla mode enter se accede a las modificaciones. En la fábrica la bomba se programa en modo constante. La bomba vuelve automáticamente al modo de funcionamiento después de 1 minuto de inactividad. En este caso los datos que se han introducido no serán memorizados. Con la tecla esc se sale de los niveles de la programación. Al salir de la programación el display visualiza:

Exit	∇ Δ	Exit
No Save		Save

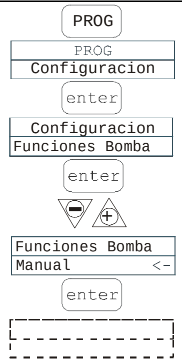
mode enter para confirmar la elección

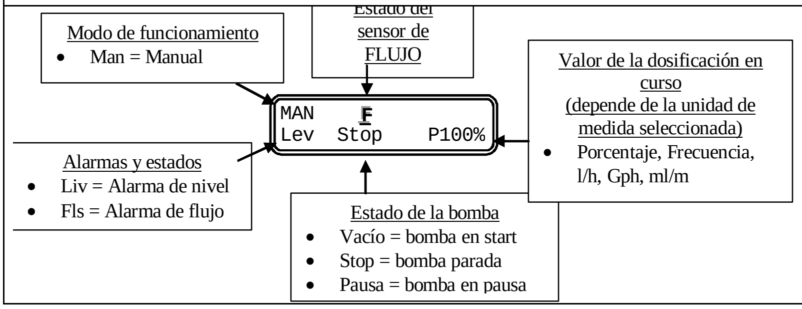
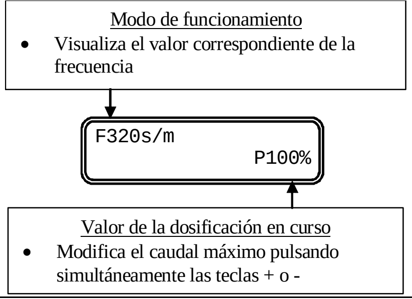

PROG
PROG
Configuracion
enter
Calib. Bomba
0,23 cc/imp
Párrafo 11
Statisticas
Horas= ###,##
Párrafo 12
Password
****
Párrafo 13
Paus
N.Abierto
Párrafo 17
Unidades
Standard
Párrafo 16
Alarmas
Nivel Off
Párrafo 15
Alarmas
Caudal Off
Párrafo 14
Menú principal
Configuracion
Funciones Bomba
enter
Caudal maximo
100 %
Párrafo 9
Idioma
Espagnol
Rele Alarma
Abierto
Párrafo 10
Menú de ajustes
Funciones Bomba
Manual <-
Párrafo 1
Funciones Bomba
0/4 - 20 mA
Párrafo 2
Funciones Bomba
20 - 4/0 mA
Párrafo 3
Funciones Bomba
Multiplic.(1:n)
Párrafo 4
Funciones Bomba
Divisor (n:1)
Párrafo 5
Funciones Bomba
Modo Batch
Párrafo 6
Funciones Bomba
Modo ppm
Párrafo 7
Funciones Bomba
Temporizacion
Párrafo 8
Menú de funciones

Programación del idioma

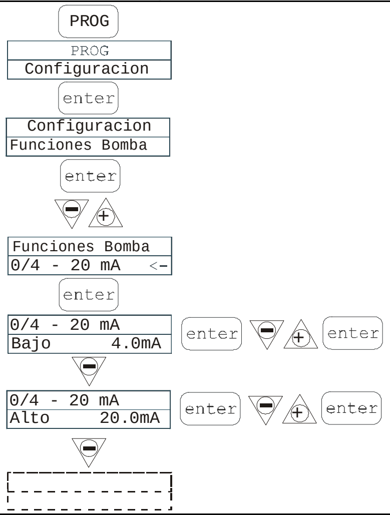
Programación	Funcionamiento
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open Language English enter enter	Permite seleccionar el idioma, en la fábrica la bomba se programa en inglés. Pulsando la tecla mode enter se accede a la modificación, con las teclas ⊕ ⊖ se programa el valor. Con la tecla mode enter se confirma y se vuelve al menú principal.

Párrafo 1 – Dosificación manual

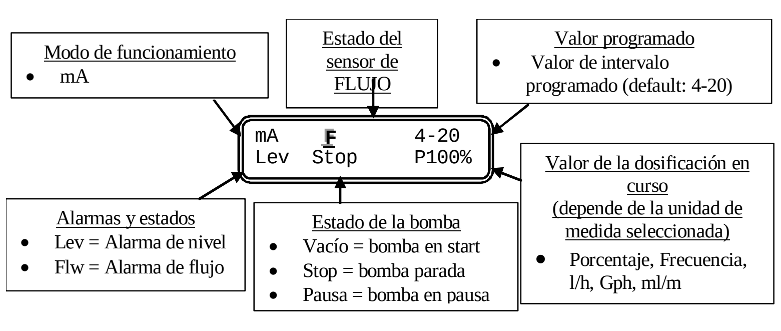
Programación	Funcionamiento
 PROG PROG Configuracion enter Configuracion Funciones Bomba enter Funciones Bomba Manual <- enter	La bomba trabaja en modo constante. El caudal se regula manualmente pulsando simultáneamente las teclas mode enter ⊕ para aumentarlo o las teclas mode enter ⊖ para disminuirlo.

Visualización durante el funcionamiento	Visualización en programación (tecla MODE)
 MAN F Lev Stop P100% Modo de funcionamiento - Man = Manual Estado del sensor de FLUJO Valor de la dosificación en curso (depende de la unidad de medida seleccionada) - Porcentaje, Frecuencia, l/h, Gph, ml/m Alarmas y estados - Liv = Alarma de nivel - Fls = Alarma de flujo Estado de la bomba - Vacío = bomba en start - Stop = bomba parada - Pausa = bomba en pausa	 F320s/m P100% Modo de funcionamiento - Visualiza el valor correspondiente de la frecuencia Valor de la dosificación en curso - Modifica el caudal máximo pulsando simultáneamente las teclas + o -

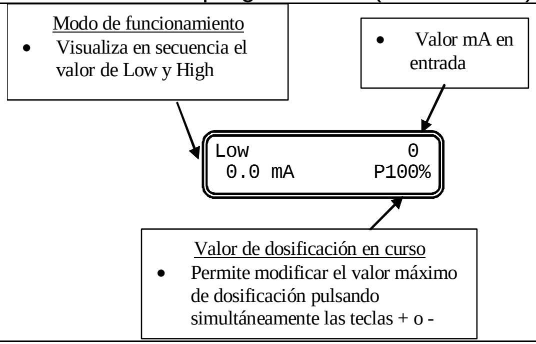
Párrafo 2 – Dosificación Proporcional con señal 0/4-20 mA

Programación	Funcionamiento
 PROG PROG Configuracion enter Configuracion Funciones Bomba enter Funciones Bomba 0/4 - 20 mA <- enter 0/4 - 20 mA Bajo 4.0mA enter enter 0/4 - 20 mA Alto 20.0mA enter enter	La bomba dosifica proporcionalmente al recibir una señal (0) 4-20 mA. Según su programación de fábrica, la bomba interrumpe la dosificación a 4 mA y dosifica a la máxima frecuencia programada cuando recibe 20 mA. En programación se pueden modificar estos dos valores. La frecuencia máxima se puede modificar durante el funcionamiento pulsando simultáneamente las teclas mode enter ⊕ para aumentar el caudal o las teclas mode enter ⊖ para disminuirlo.

Visualización durante el funcionamiento

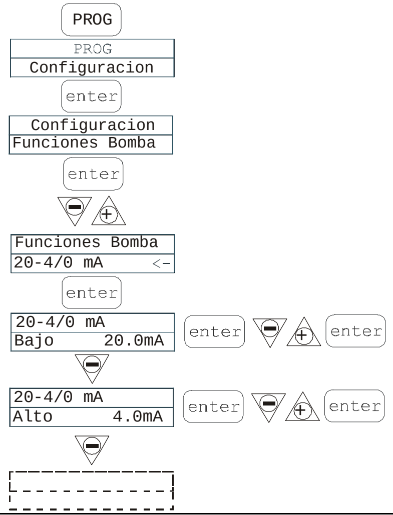

Modo de funcionamiento
mA
Estado del sensor de FLUJO
Valor programado
Valor de intervalo programado (default: 4-20)
mA F 4-20
Lev Stop P100%
Valor de la dosificación en curso (depende de la unidad de medida seleccionada)
Porcentaje, Frecuencia, l/h, Gph, ml/m
Alarmas y estados
Lev = Alarma de nivel
Flw = Alarma de flujo
Estado de la bomba
Vacío = bomba en start
Stop = bomba parada
Pausa = bomba en pausa

Visualización en programación (tecla MODE)


Modo de funcionamiento
Visualiza en secuencia el valor de Low y High
Valor mA en entrada
Low 0
0.0 mA P100%
Valor de dosificación en curso
Permite modificar el valor máximo de dosificación pulsando simultáneamente las teclas + o -

Párrafo 3 – Dosificación Proporcional con señal 20-4/0 mA

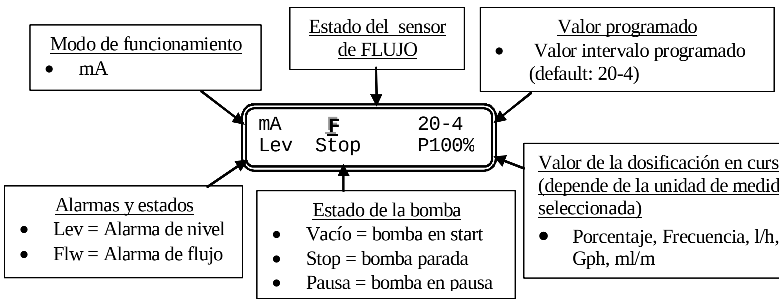
Programación


PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
20-4/0 mA <-
enter
20-4/0 mA
Bajo 20.0mA
enter
enter
20-4/0 mA
Alto 4.0mA
enter
enter

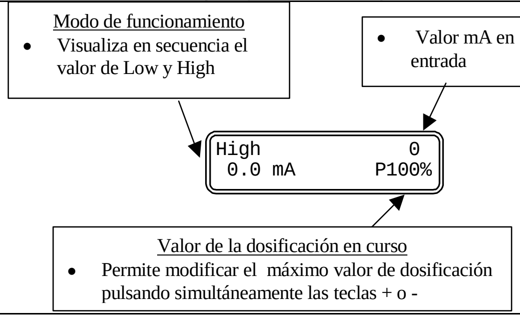
Funcionamiento

La bomba dosifica proporcionalmente al recibir una señal 20-4 (0) mA. Según su programación de fábrica, la bomba interrumpe la dosificación a 20 mA y dosifica a la máxima frecuencia programada cuando recibe 4 mA. En programación es posible modificar estos valores. La frecuencia máxima se puede modificar durante el funcionamiento pulsando simultáneamente las teclas mode enter ⊕ para aumentar el caudal o las teclas mode enter ⊖ para disminuirlo.

Visualización durante el funcionamiento

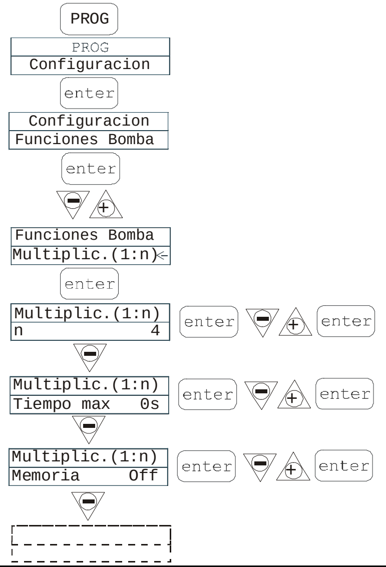

Modo de funcionamiento
mA
Estado del sensor de FLUJO
Valor programado
Valor intervalo programado (default: 20-4)
mA F 20-4
Lev Stop P100%
Valor de la dosificación en curs (depende de la unidad de medid seleccionada)
Porcentaje, Frecuencia, l/h, Gph, ml/m
Alarmas y estados
Lev = Alarma de nivel
Flw = Alarma de flujo
Estado de la bomba
Vacío = bomba en start
Stop = bomba parada
Pausa = bomba en pausa

Visualización en programación (tecla MODE)


Modo de funcionamiento
Visualiza en secuencia el valor de Low y High
Valor mA en entrada
High 0
0.0 mA P100%
Valor de la dosificación en curso
Permite modificar el máximo valor de dosificación pulsando simultáneamente las teclas + o -

Párrafo 4 – Proporcional con impulsos externos (multiplicación)

Programación

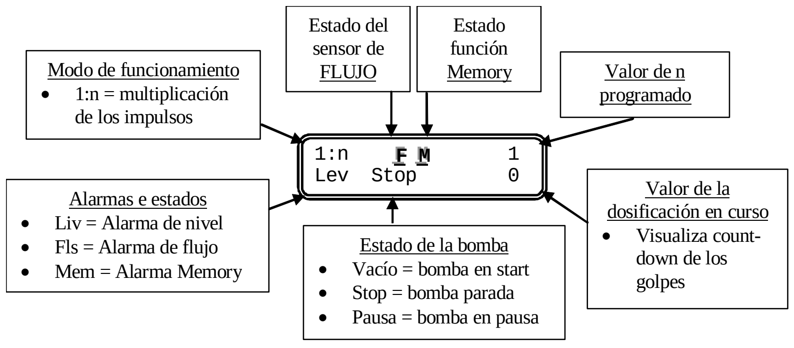

PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Multiplic.(1:n)<-
enter
Multiplic.(1:n)
n 4
enter
enter
Multiplic.(1:n)
Tiempo max 0s
enter
enter
Multiplic.(1:n)
Memoria Off
enter
enter

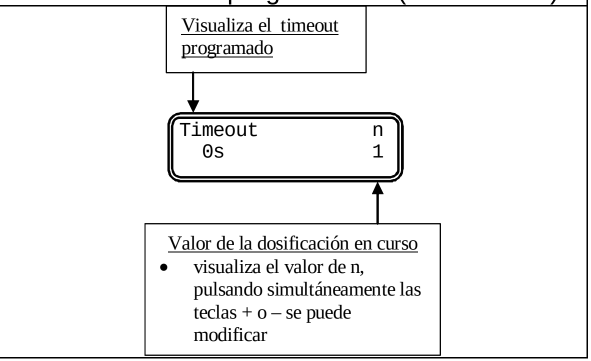
Funcionamiento

La bomba dosifica proporcionalmente al recibir una señal externa (ejemplo: contador lanza impulsos). A cada señal recibida la bomba realiza los “n” golpes programados. La bomba programa automáticamente la frecuencia de la dosificación, adaptándola al tiempo que transcurre entre dos señales sucesivas. Es posible programar en segundos el tiempo (time out) más allá del cual la bomba pone en cero el conteo del intervalo, para evitar dosificaciones en tiempos demasiado largos. La bomba dispone de la función *memory* que señala el recibimiento de una señal durante la dosificación. Si está programada en OFF se limita a señalar, si está programada en ON señala y memoriza los impulsos y los ejecuta cuando termina de recibir señales.

El valor de “n” se puede modificar durante el funcionamiento pulsando simultáneamente las teclas mode enter ⊕ para aumentar el valor del caudal o las teclas mode enter ⊖ para disminuirlo.

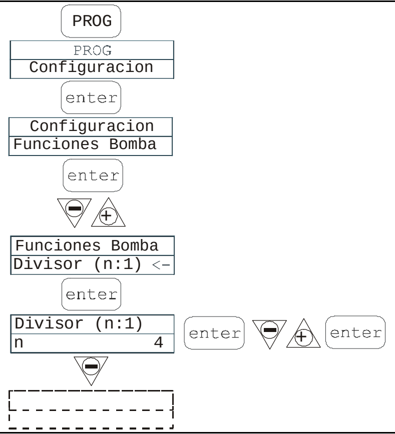
Visualización durante el funcionamiento | Visualización en programación (tecla MODE)


Modo de funcionamiento
1:n = multiplicación de los impulsos
Estado del sensor de FLUJO
Estado función Memory
Valor de n programado
1:n F M 1
Lev Stop 0
Alarmas e estados
Liv = Alarma de nivel
Fls = Alarma de flujo
Mem = Alarma Memory
Estado de la bomba
Vacío = bomba en start
Stop = bomba parada
Pausa = bomba en pausa
Valor de la dosificación en curso
Visualiza count-down de los golpes


Visualiza el timeout programado
Timeout n
0s 1
Valor de la dosificación en curso
visualiza el valor de n, pulsando simultáneamente las teclas + o – se puede modificar

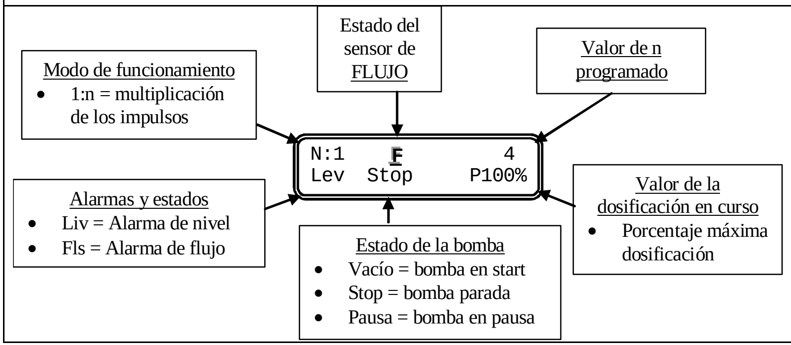
Párrafo 5 – Proporcional con impulsos externos (división)

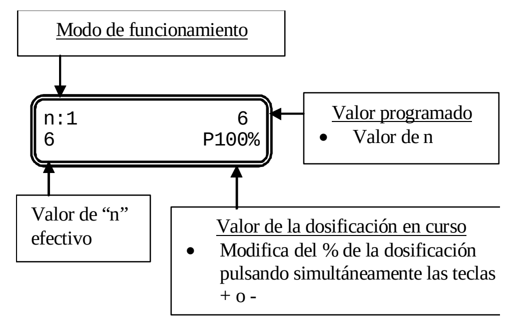
Programación | Funcionamiento


PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Divisor (n:1) <-
enter
Divisor (n:1)
n 4
enter
enter

La bomba dosifica proporcionalmente al recibir una señal externa (ejemplo: contador lanza impulsos). A cada “n” señales recibidas la bomba realiza un golpe. En programación se programa el valor de “n”. Programando el valor de “n” se programa el % de máxima dosificación, durante el funcionamiento se puede modificar este valor pulsando simultáneamente las teclas mode enter ⊕ para aumentarlo o las teclas mode enter ⊖ para disminuirlo.

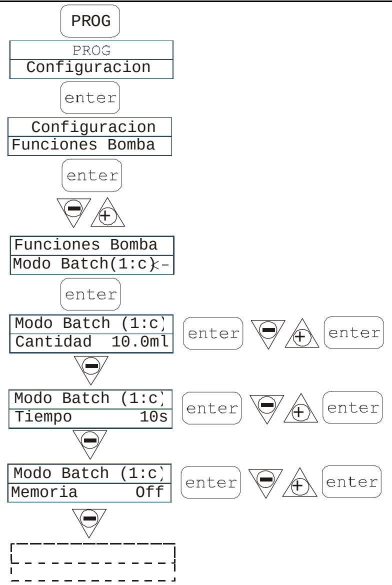
Visualización durante el funcionamiento | Visualización en programación (tecla MODE)


Modo de funcionamiento
1:n = multiplicación de los impulsos
Estado del sensor de FLUJO
Valor de n programado
N:1 F 4
Lev Stop P100%
Alarmas y estados
Liv = Alarma de nivel
Fls = Alarma de flujo
Estado de la bomba
Vacío = bomba en start
Stop = bomba parada
Pausa = bomba en pausa
Valor de la dosificación en curso
Porcentaje máxima dosificación


Modo de funcionamiento
n:1 6
6 P100%
Valor programado
Valor de n
Valor de “n” efectivo
Valor de la dosificación en curso
Modifica del % de la dosificación pulsando simultáneamente las teclas + o -

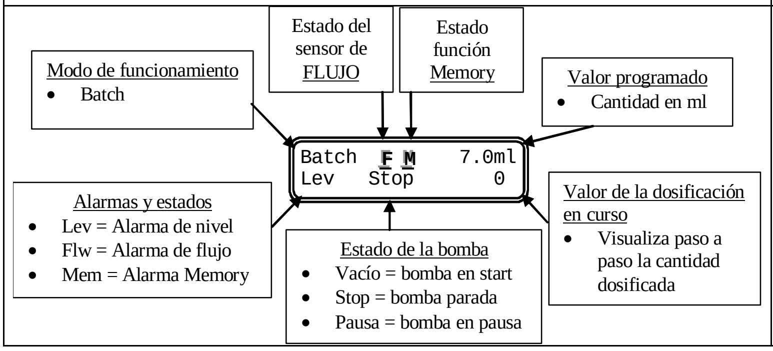
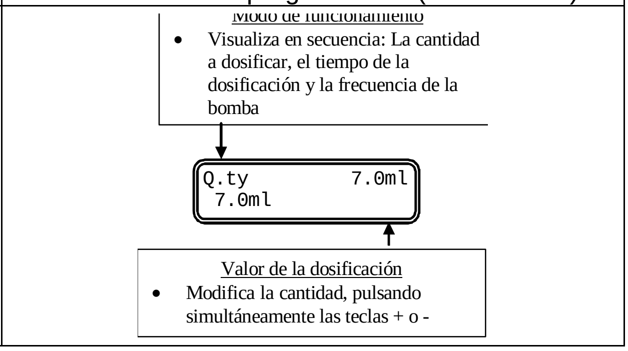
Párrafo 6 – Proporcional con impulsos externos (dosificación Batch)

Programación | Funcionamiento


PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Modo Batch(1:c)<-
enter
Modo Batch (1:c)
Cantidad 10.0ml
enter
enter
Modo Batch (1:c)
Tiempo 10s
enter
enter
Modo Batch (1:c)
Memoria Off
enter
enter

La bomba dosifica proporcionalmente al recibir una señal externa (ejemplo: contador lanza impulsos). En este caso se puede programar la cantidad a dosificar en ml y el tiempo para terminar la dosificación. Es posible poner en marca la dosificación manualmente pulsando la tecla ⊕ o con un mando remoto. La tecla start stop interrumpe la dosificación que se puede poner en cero pulsando la tecla ⊕ o se puede volver a poner en marcha pulsando otra vez la tecla start stop.

La cantidad a dosificar se puede modificar durante el funcionamiento pulsando simultáneamente las teclas mode enter ⊕ para aumentar el caudal o las teclas mode enter ⊖ para disminuirlo.

Visualización durante el funcionamiento	Visualización en programación (tecla MODE)
	

Batch F M 7.0ml
Lev Stop 0
Q.ty 7.0ml
7.0ml

Modo de funcionamiento
- Batch

Estado del sensor de FLUJO

Estado función Memory

Valor programado
- Cantidad en ml

Alarmas y estados
- Lev = Alarma de nivel
- Flw = Alarma de flujo
- Mem = Alarma Memory

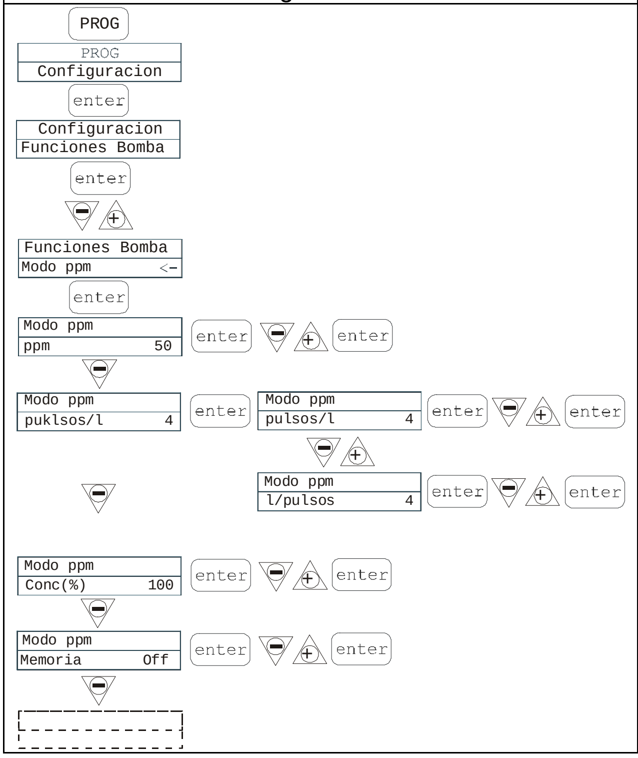
Estado de la bomba
- Vacío = bomba en start
- Stop = bomba parada
- Pausa = bomba en pausa

Valor de la dosificación en curso
- Visualiza paso a paso la cantidad dosificada

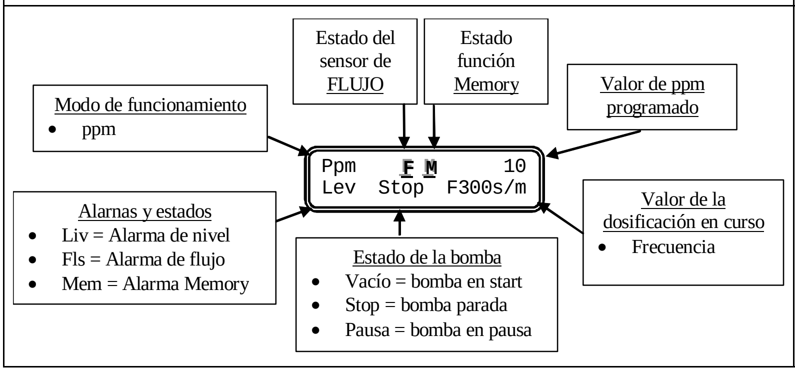
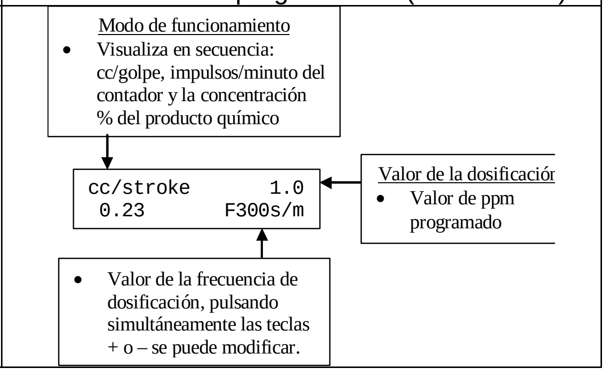
Modo de funcionamiento
- Visualiza en secuencia: La cantidad a dosificar, el tiempo de la dosificación y la frecuencia de la bomba

Valor de la dosificación
- Modifica la cantidad, pulsando simultáneamente las teclas + o -

Párrafo 7 – Proporcional con impulsos externos (dosificación en ppm)

Programación	Funcionamiento
	La bomba dosifica proporcionalmente al recibir una señal externa (ejemplo: contador lanza impulsos) calculando automáticamente la relación entre las señales en entrada y los golpes de la bomba en función del valor de ppm programado. Los datos que se deben introducir son el valor de ppm, la relación impulsos/litro (o litros/impulso) del contador y la concentración del producto a dosificar. Durante el funcionamiento se puede modificar la frecuencia de la dosificación pulsando simultáneamente las teclas mode enter ⊕ para aumentarla o las teclas mode enter ⊖ para disminuirla.

PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Modo ppm <-
enter
Modo ppm
ppm 50
enter
enter
Modo ppm
puklsos/l 4
enter
Modo ppm
pulsos/l 4
enter
enter
Modo ppm
l/pulsos 4
enter
enter
Modo ppm
Conc(%) 100
enter
enter
Modo ppm
Memoria Off
enter
enter

Visualización durante el funcionamiento	Visualización en programación (tecla MODE)
	

Ppm F M 10
Lev Stop F300s/m
cc/stroke 1.0
0.23 F300s/m

Modo de funcionamiento
- ppm

Estado del sensor de FLUJO

Estado función Memory

Valor de ppm programado

Alarnas y estados
- Liv = Alarma de nivel
- Fls = Alarma de flujo
- Mem = Alarma Memory

Estado de la bomba
- Vacío = bomba en start
- Stop = bomba parada
- Pausa = bomba en pausa

Valor de la dosificación en curso
- Frecuencia

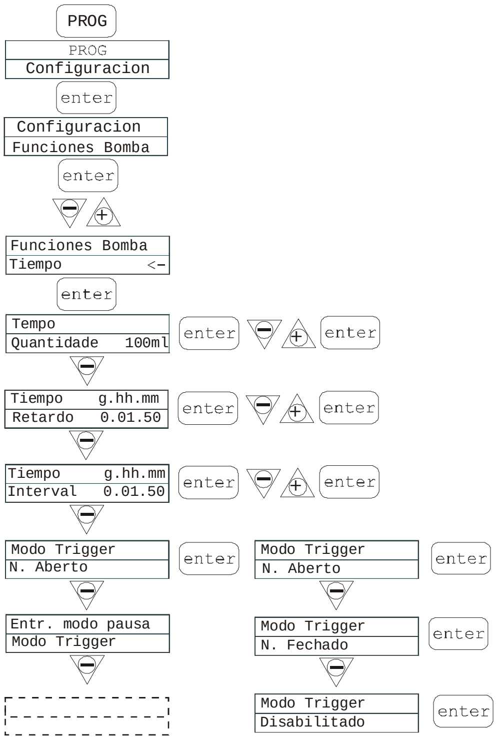
Modo de funcionamiento
- Visualiza en secuencia: cc/golpe, impulsos/minuto del contador y la concentración % del producto químico

Valor de la dosificació
- Valor de ppm programado

- Valor de la frecuencia de dosificación, pulsando simultáneamente las teclas + o – se puede modificar.

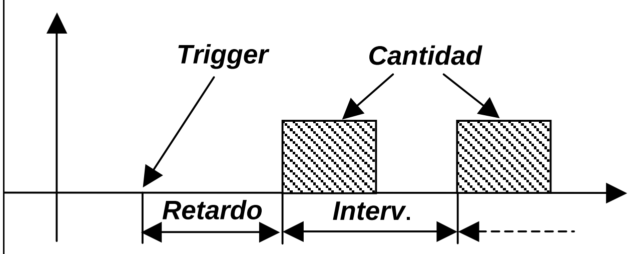
Párrafo 8 – Dosificación temporizada *(Entrada señal de frecuencia “TRIGGER” activada)*

Programación

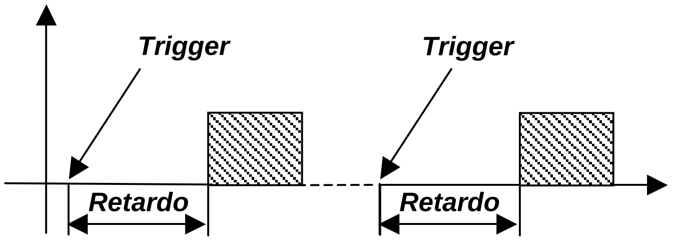

PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Tiempo <-
enter
Tempo
Quantidade 100ml
enter
enter
Tiempo g.hh.mm
Retardo 0.01.50
enter
enter
Tiempo g.hh.mm
Interval 0.01.50
enter
enter
Modo Trigger
N. Aberto
enter
Modo Trigger
N. Aberto
enter
Entr. modo pausa
Modo Trigger
Modo Trigger
N. Fechado
enter
Modo Trigger
Disabilitado
enter

Funcionamiento

Después de recibir la señal de ***TRIGGER*** programada, la bomba dosifica una cantidad programable en ml. Es posible programar un tiempo de retardo antes de la dosificación (***Retardo***) y la distancia entre dosificaciones sucesivas (***Interv***.) como se ilustra en el esquema:


Trigger
Cantidad
Retardo
Interv.

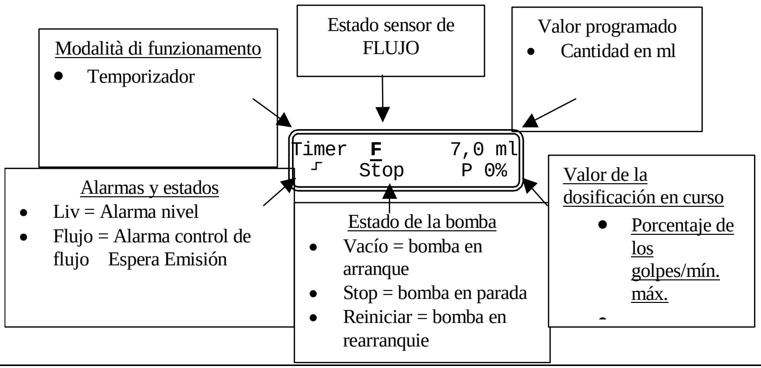
Por ejemplo, programando un tiempo ***Interv***.= 0 se obtiene un sistema en el que la cantidad programada es dosificada después de cada señal de ***TRIGGER*** (con el posible retardo programado):


Trigger
Trigger
Retardo
Retardo

También puede ponerse en marcha la dosificación pulsando la tecla +, que prácticamente simula la señal de ***Trigger***.
La señal ***Trigger*** puede programarse en ***N. Aberto*** (se activa cuando la entrada pasa del modo abierto al cerrado) o en ***N. Fechado*** (se activa cuando la entrada pasa del modo cerrado al abierto).
La señal ***Trigger*** permanece bloqueada durante la dosificación (su recepción no es memorizada ni gestionada).
La entrada ***Pausa*** (***Entrada mando a distancia***) no puede ser programada y su activación bloquea la dosificación, mientras que la siguiente desactivación vuelve a poner el sistema en estado de espera de la señal ***Trigger*** para efectuar una nueva dosificación.

Durante el funcionamiento de la bomba se puede modificar la frecuencia de dosificación pulsando simultáneamente las teclas mode enter ⊕ para aumentar la frecuencia o las teclas mode enter ⊖ para disminuirla.

Visualización durante el funcionamiento


Timer F 7,0 ml
Stop P 0%

Modalità di funzionamento
- Temporizador

Estado sensor de FLUJO

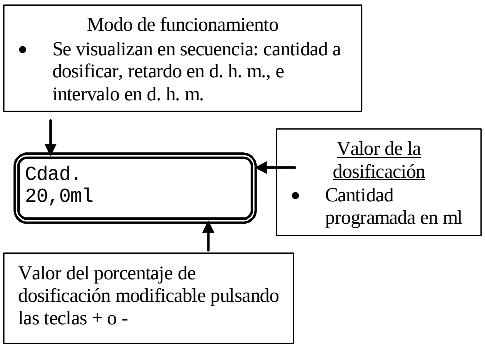
Valor programado
- Cantidad en ml

Alarmas y estados
- Liv = Alarma nivel
- Flujo = Alarma control de flujo Espera Emisión

Estado de la bomba
- Vacío = bomba en arranque
- Stop = bomba en parada
- Reiniciar = bomba en rearranquie

Valor de la dosificación en curso
- Porcentaje de los golpes/mín. máx.

Visualización en programación (tecla MODE)



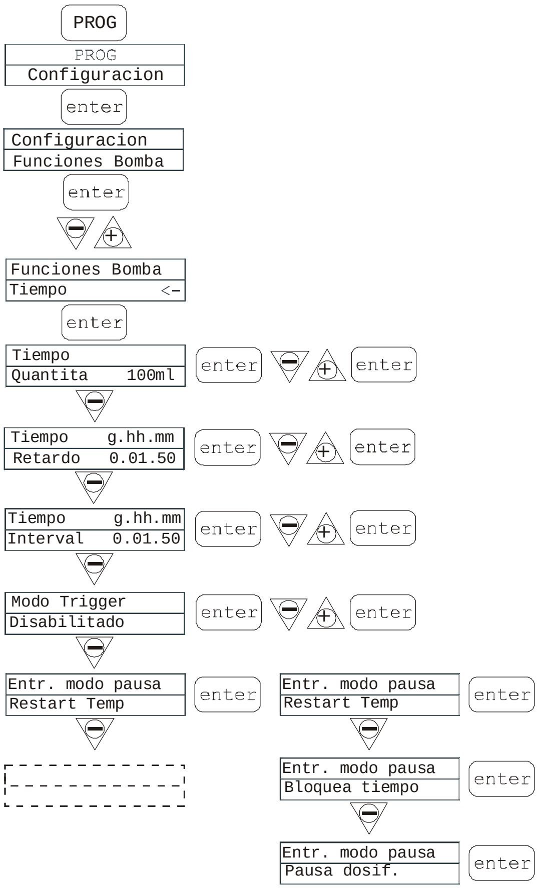
Modo de funcionamiento
- Se visualizan en secuencia: cantidad a dosificar, retardo en d. h. m., e intervalo en d. h. m.

Valor de la dosificación
- Cantidad programada en ml

Valor del porcentaje de dosificación modificable pulsando las teclas + o -

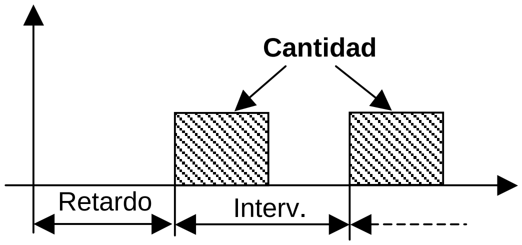
Párrafo 8 – Dosificación temporizada ***(Entrada señal de frecuencia “TRIGGER”no activada)***

Programación


PROG
PROG
Configuracion
enter
Configuracion
Funciones Bomba
enter
Funciones Bomba
Tiempo <–
enter
Tiempo
Quantita 100ml
enter
enter
Tiempo g.hh.mm
Retardo 0.01.50
enter
enter
Tiempo g.hh.mm
Interval 0.01.50
enter
enter
Modo Trigger
Disabilitado
enter
enter
Entr. modo pausa
Restart Temp
enter
Entr. modo pausa
Restart Temp
enter
Entr. modo pausa
Bloquea tiempo
enter
Entr. modo pausa
Pausa dosif.
enter

Funcionamiento

La bomba dosifica una cantidad que se puede programar en ml; se puede programar un tiempo de retardo para la puesta en marcha de la bomba (***Retardo***) y la distancia entre dos dosificaciones sucesivas (***Interv.***), como se muestra en el esquema:


Cantidad
Retardo
Interv.

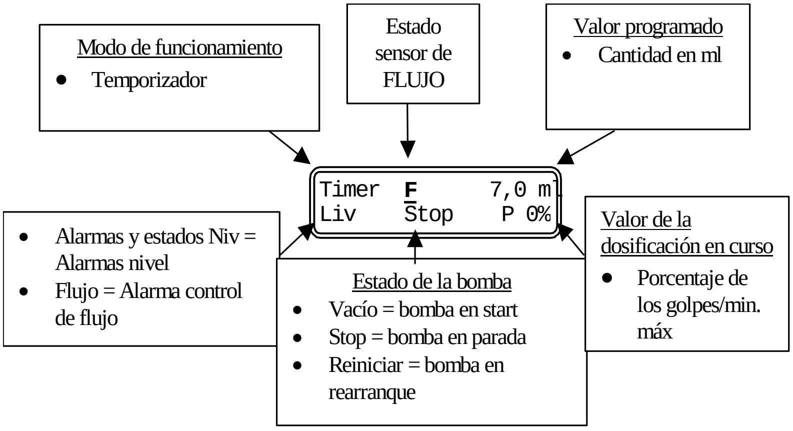
Los tiempos de ***Retardo*** y de ***Interv*** son en d.h.m. (días, horas, minutos).

La entrada de la ***Pausa*** puede programarse de tres modos distintos:

1. ***Bloquea tiempo:*** con la pausa activada, el sistema bloquea el conteo del tiempo actual y lo reanuda cuando se desactiva la pausa.
2. ***Pausa dosificación***: con la pausa activada, el sistema sigue contando el tiempo y bloquea la dosificación
3. ***Restart temp***: con la pausa activada, el sistema bloquea la dosificación y al desactivarse la pausa el conteo empieza de nuevo desde el principio.

Durante el funcionamiento de la bomba se puede modificar la frecuencia de dosificación pulsando simultáneamente las teclas mode enter ⊕ para aumentar la frecuencia o las teclas mode enter ⊖ para disminuirla.

Visualización durante el funcionamiento


Timer F 7,0 ml
Liv Stop P 0%

Modo de funcionamiento
- Temporizador

Estado sensor de FLUJO

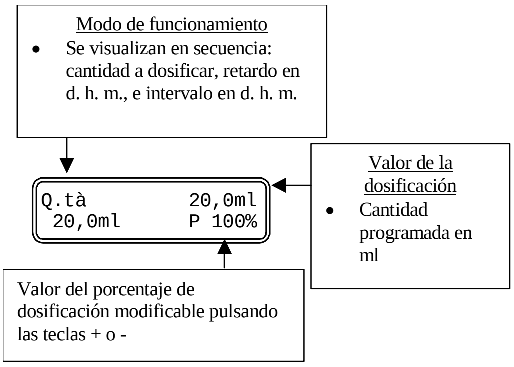
Valor programado
- Cantidad en ml

- Alarmas y estados Niv = Alarmas nivel
- Flujo = Alarma control de flujo

Estado de la bomba
- Vacío = bomba en start
- Stop = bomba en parada
- Reiniciar = bomba en rearranque

Valor de la dosificación en curso
- Porcentaje de los golpes/min. máx

Visualización en programación (tecla MODE)

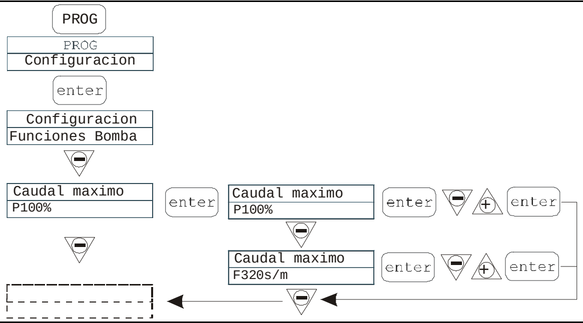

Q.tà 20,0ml
20,0ml P 100%

Modo de funcionamiento
- Se visualizan en secuencia: cantidad a dosificar, retardo en d. h. m., e intervalo en d. h. m.

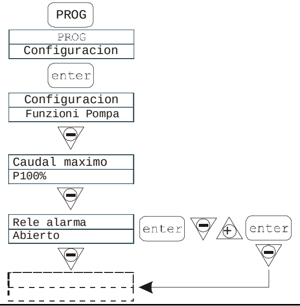
Valor de la dosificación
- Cantidad programada en ml

Valor del porcentaje de dosificación modificable pulsando las teclas + o -

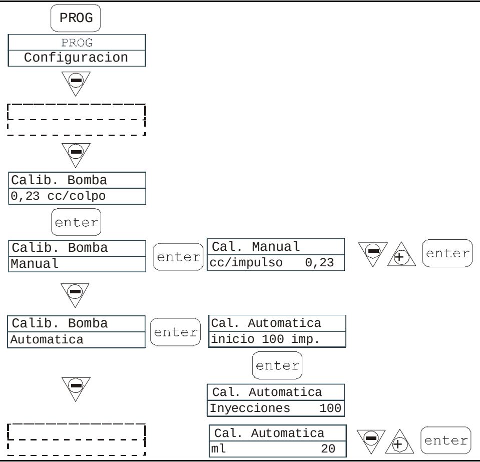
Párrafo 9 – Programación del caudal máximo

Programación	Funcionamiento
 PROG PROG Configuracion enter Configuracion Funciones Bomba Caudal maximo P100% enter Caudal maximo P100% enter enter Caudal maximo F320s/m enter enter	Permite programar el caudal máximo que la bomba puede alcanzar; el modo programado (% o frecuencia) se vuelve la visualización del caudal en la unidad de medida estándar. Pulsando la tecla mode enter se accede a la modificación, después con las teclas ⊕ ⊖ se programa el valor. Con la tecla mode enter se confirma y se vuelve al menú principal.

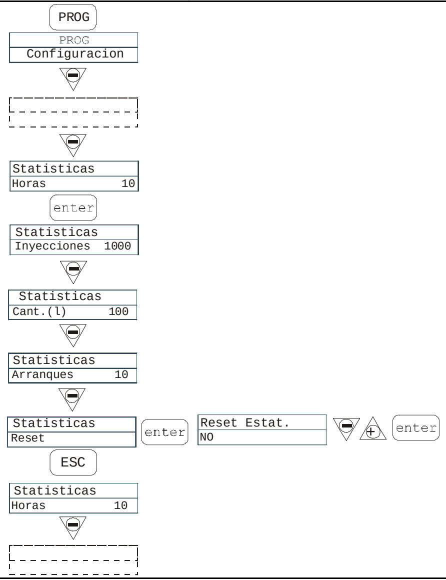
Párrafo 10 – Programación del relé de alarma

Programación	Funcionamiento
 PROG PROG Configuracion enter Configuracion Funzioni Pompa Caudal maximo P100% Rele alarma Abierto enter enter	En ausencia de una situación de alarma se puede programar abierto (fábrica) o cerrado. Pulsando la tecla mode enter se accede a la modificación, después con las teclas ⊕ ⊖ se programa el valor. Con la tecla mode enter se confirma y se vuelve al menú principal.

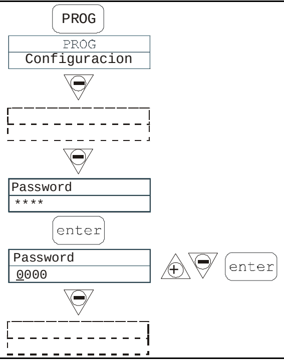
Párrafo 11 – Calibración del caudal

Programación	Funcionamiento
 PROG PROG Configuracion Calib. Bomba 0,23 cc/colpo enter Calib. Bomba Manual enter Cal. Manual cc/impulso 0,23 enter Calib. Bomba Automatica enter Cal. Automatica inicio 100 imp. enter Cal. Automatica Inyecciones 100 Cal. Automatica ml 20 enter	En el menú principal aparece el valor de cc por golpe en memoria. Se puede calibrar en dos modos: MANUAL – Introduciendo manualmente el valor de cc cada golpe con las teclas ⊕ ⊖ y confirmando con la tecla mode enter. AUTOMÁTICA – La bomba realiza 100 golpes, poner en marcha y confirmar con la tecla mode enter al final introducir la cantidad aspirada por la bomba con las teclas ⊕ ⊖ y confirmar con la tecla mode enter. El dato introducido será utilizado en los cálculos de los caudales.

Párrafo 12 – Stadísticas

Programación	Funcionamiento
 PROG PROG Configuracion Statisticas Horas 10 enter Statisticas Inyecciones 1000 Statisticas Cant.(l) 100 Statisticas Arranques 10 Statisticas Reset enter Reset Estat. NO enter ESC Statisticas Horas 10	En el menú principal visualiza las horas de funcionamiento de la bomba, pulsando la tecla mode enter se accede a las demás estadísticas: - *Strokes* = Número de golpes realizados por la bomba. - *Q.ty* (L) = Cantidad dosificada por la bomba expresada en litros; este valor se calcula en base al valor cc/*stroke* en memoria. - *Power* = Número de puestas en marcha de la bomba. - *Reset* = Con las teclas ⊕ ⊖ se pueden poner en cero (YES) o no (NO) los contadores, con la tecla mode enter se confirma. Pulsando la tecla ESC se vuelve al menú principal.

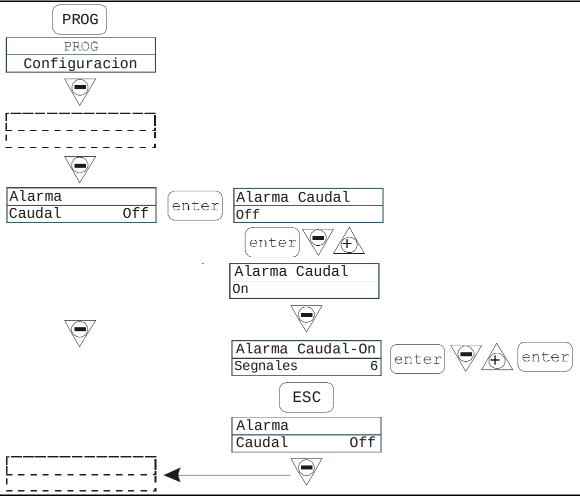
Párrafo 13 - Password

<table>
<tr><th>Programación</th><th>Funcionamiento</th></tr>
<tr><td>

PROG
PROG
Configuracion
Password
****
enter
Password
0000
enter

</td><td>Introduciendo la password se puede entrar en programación y ver todos los valores programados, pero cada vez que se quieran modificar será solicitada la password. La línea parpadeante indica el número que se puede modificar, con la tecla ⊕ se selecciona el número (de 1 a 9), con la tecla ⊖ se selecciona el número a modificar y con la tecla mode enter se confirma. Programando “0000” (fábrica) la password queda excluida.</td></tr>
</table>

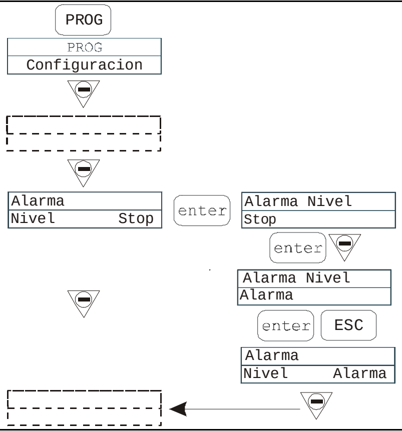
Párrafo 14 – Alarma de flujo

<table>
<tr><th>Programación</th><th>Funcionamiento</th></tr>
<tr><td>

PROG
PROG
Configuracion
Alarma
Caudal Off
enter
Alarma Caudal
Off
enter
Alarma Caudal
On
Alarma Caudal-On
Segnales 6
enter
enter
ESC
Alarma
Caudal Off

</td><td>Permite activar (desactivar) el sensor de flujo. Una vez activado (ON) pulsando la tecla ⊖ se accede a la solicitud de cuántas señales espera la bomba antes de entrar en alarma. Pulsando la tecla mode enter el número parpadea, con las teclas ⊕ ⊖ se puede programar el valor. Con la tecla mode enter se confirma. Pulsando la tecla esc se vuelve al menú principal.</td></tr>
</table>

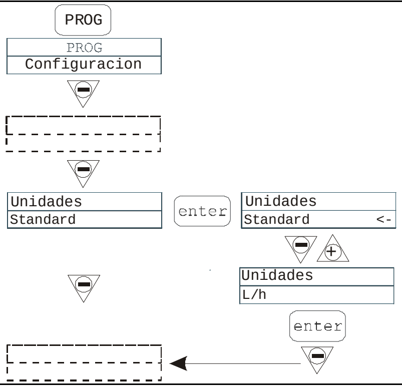
Párrafo 15 – Alarma de nivel

<table>
<tr><th>Programación</th><th>Funcionamiento</th></tr>
<tr><td>

PROG
PROG
Configuracion
Alarma
Nivel Stop
enter
Alarma Nivel
Stop
enter
Alarma Nivel
Alarma
enter
ESC
Alarma
Nivel Alarma

</td><td>Permite programar la bomba cuando se activa la alarma del sensor de nivel, es decir se bloquea la dosificación (Stop) o simplemente activa la señal de alarma sin bloquear la dosificación. Pulsando mode enter la tecla se accede a la modificación, con las teclas ⊕ ⊖ se puede programar el tipo de alarma. Con la tecla mode enter se confirma. Pulsando la tecla esc se vuelve al menú principal.</td></tr>
</table>

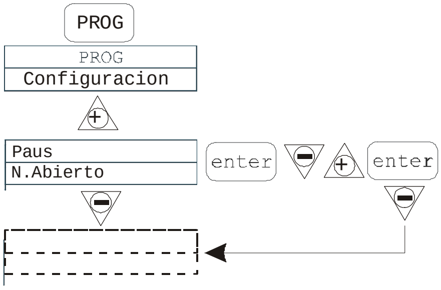
Párrafo 16 – Unidad de visualización del caudal

<table>
<tr><th>Programación</th><th>Funcionamiento</th></tr>
<tr><td>

PROG
PROG
Configuracion
Unidades
Standard
enter
Unidades
Standard <-
Unidades
L/h
enter

</td><td>Permite programar la unidad de medida de la dosificación con el display en visualización. Pulsando la tecla mode enter se accede a la modificación, con las teclas ⊕ ⊖ se programa el tipo de unidad de medida, l/h (litros/hora), Gph (galones/hora), ml/m (mililitros/minuto) o estándar (% o frecuencia, según como haya sido programado). Con la tecla mode enter se confirma y se vuelve al menú principal.</td></tr>
</table>

Párrafo 17 - Programación Pausa

Programación	Funcionamiento
 PROG PROG Configuracion Paus N.Abierto enter enter	Entrada esterna de paro de bomba. De fábrica el sistema llega configurado como Normalmente Abierto. Pulsando la tecla mode enter se accede a la modificación, después con las teclas ▲ ▼ se programa el valor (N. ABIERTO o N. CERRADO.) Con la tecla mode enter se confirma y se vuelve al menú principal.

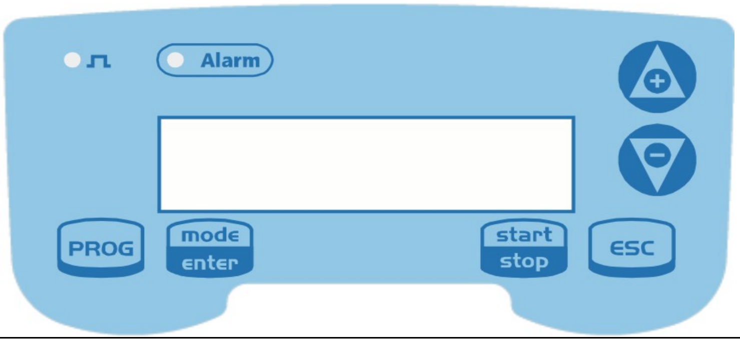
Ajuste contraste display

Para ajustar el contraste del display mantener presionada la tecla esc y dentro de 5 segundos presionar las teclas ▲ o ▼ para aumentar o disminuir el contraste

Alarmas

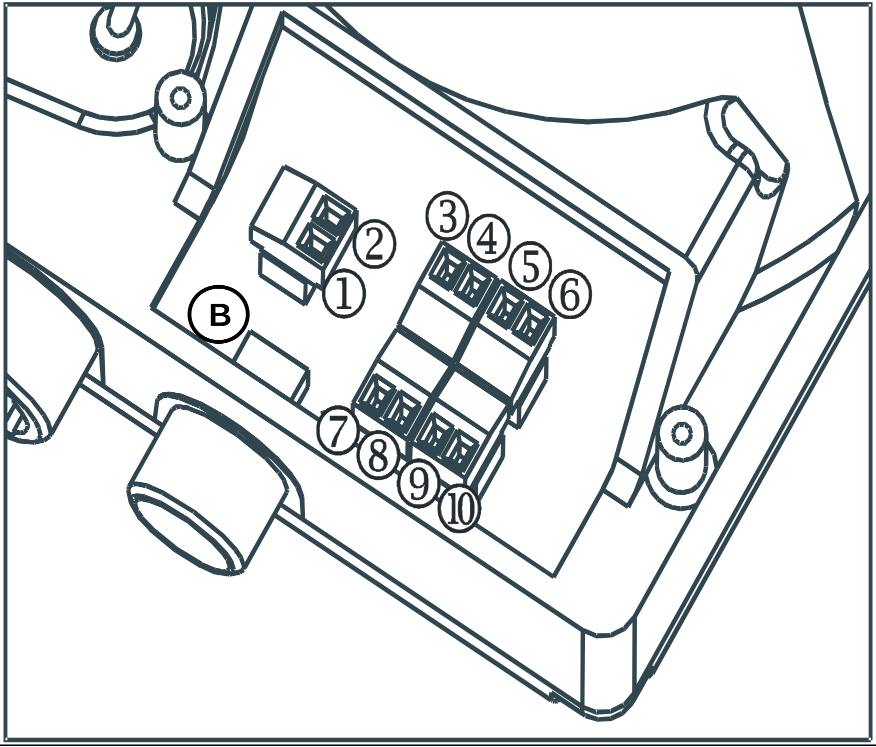
Visualización	**Causa**	**Interrupción**
Led Alarma fijo Mensaje Lev parpadeante Ej: Man Lev P100%	Alarma de final del nivel sin interrupción del funcionamiento de la bomba.	Reestablecer el nivel del líquido.
Led Alarma fijo Mensajes Lev y stop parpadeantes Ej: Man Lev Stop P100%	Alarma final del nivel con interrupción del funcionamiento de la bomba.	Reestablecer el nivel del líquido.
Mensaje Mem parpadeante Ej: 1:n 6 Mem	La bomba recibe uno o más impulsos durante la dosificación con la función *memory* en OFF.	Pulsar la tecla start stop
Mensaje Mem parpadeante Ej: 1:n M 6 Mem	La bomba recibe uno o más impulsos durante la dosificación con la función *memory* en ON.	Cuando la bomba termina de recibir los impulsos externos devuelve los golpes memorizados.
Led Alarma fijo Mensaje Flw parpadeante Ej: Man F Flw P100%	Alarma de flujo activa, la bomba no ha recibido el número de señales programadas por el sensor de flujo.	Pulsar la tecla start stop
Ej: Parameter Error PROG to default	Error de comunicación interna de la CPU.	Pulsar la tecla PROG para reestablecer los parámetros de *default*.

Panneau de contrôle – TEKNA TPG



PROG	Accès au menu de programmation
mode enter	Pendant la phase de fonctionnement de la pompe: si cette touche est enfoncée elle affiche à des intervalles réguliers les valeurs programmées; si elle est enfoncée en même temps que les touches ⊕ ⊖ elle augmente ou réduit une valeur dépendant du mode de fonctionnement choisi. Au cours de la programmation, elle fait fonction de “enter”, c’est-à-dire qu’elle confirme l’entrée dans les différents niveaux de menu et les modifications à l’intérieur de ces derniers.
start stop	Fait démarrer et met à l’arrêt la pompe. Dans les conditions d’alarme de niveau (unique fonction d’alarme), de flux et de mémoires actives, elle désactive la signalisation sur l’afficheur.
ESC	Pour “quitter” ces différents niveaux de menu. Avant de quitter définitivement la programmation, on accède à la demande d’enregistrement des modifications
⊕	Fait défiler les menus vers le haut ou augmente les valeurs numériques à modifier. En mode de fonctionnement Batch, elle peut faire démarrer le dosage.
⊖	Fait défiler les menus vers le bas, ou réduit les valeurs numériques à modifier.
⎍	Led verte clignotante pendant le dosage.
Alarm	Led rouge qui s’allume dans les différentes situations d’alarme.

Connexions électriques



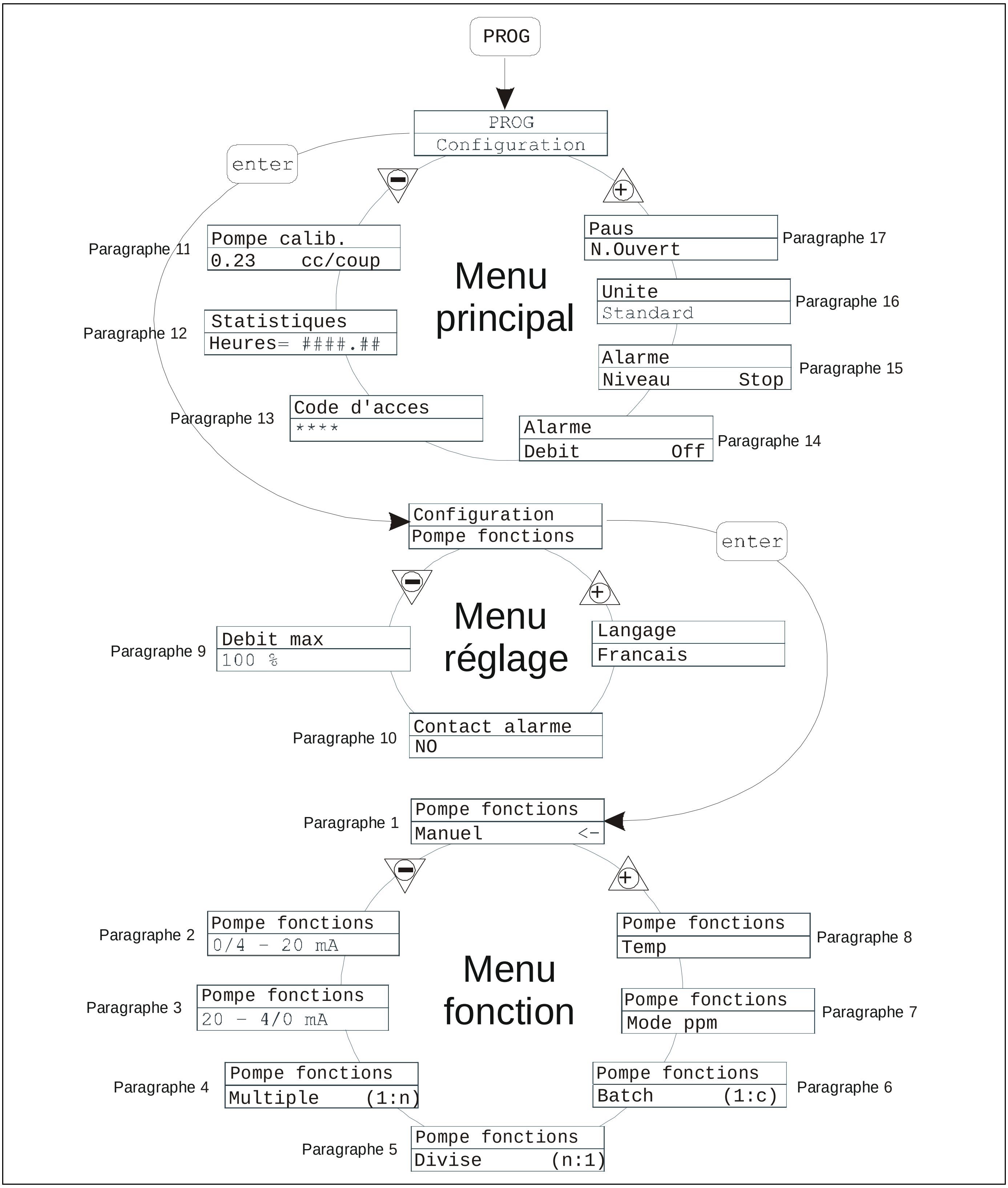
1	Relais Alarme	
2		
3	Pole +	Entrée signal 4-20 mA Impédance D'Entrée: 200 ohm
4	Pole -	
5	-Entrée commande à distance (start-stop) -Entrée Pausa signal	
6		
7	-Entrée signal fréquence (compteur émetteur d’impulsions) -Entrée Detente externo	
8		
9	Entrée capteur de débit	
10		
B	Entrée sonde de niveau	

Menu de programmation Tekna TPG

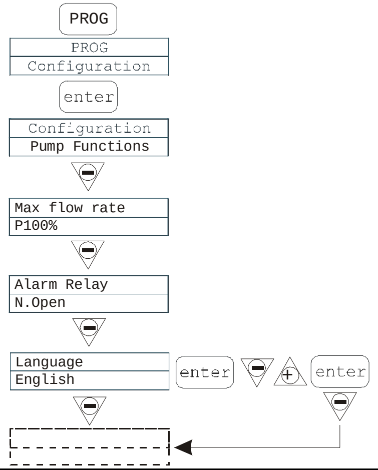
Appuyer sur la touche PROG pendant plus de trois secondes pour allumer la programmation. Avec les touches ⊕ ⊖ il est possible de faire défiler les options du menu, la touche mode enter permet d'accéder aux modifications.
La pompe est programmée en usine en mode constant. La pompe reprend automatiquement le mode de fonctionnement après 1 minute de non-activité. Dans ce cas, les données éventuellement introduites ne sont pas enregistrées. La touche ESC permet de quitter les niveaux de la programmation. À la sortie de la programmation, l'afficheur visualise :

```
Exit                 Exit
   No Save   ∇ Δ        Save
```

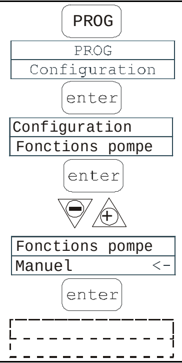
mode enter Pour confirmer le choix

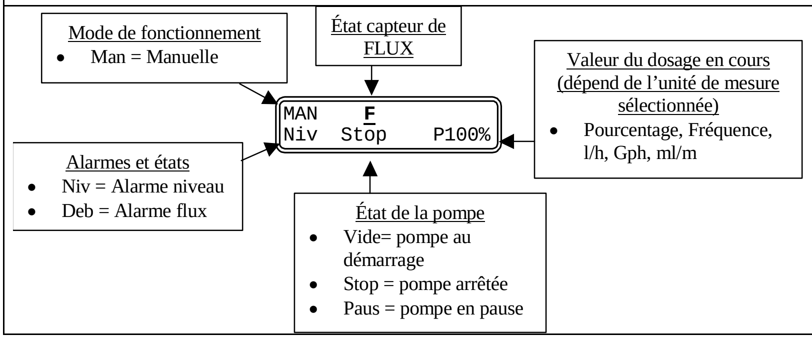
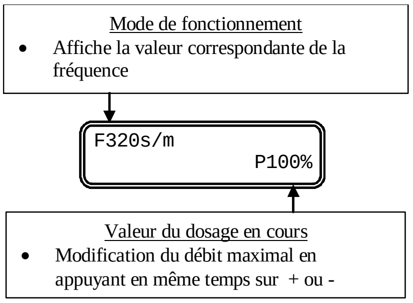

PROG
PROG
Configuration
enter
Menu principal
Paragraphe 11
Pompe calib.
0.23 cc/coup
Paragraphe 12
Statistiques
Heures= ####.##
Paragraphe 13
Code d'acces
****
Paus
N.Ouvert
Paragraphe 17
Unite
Standard
Paragraphe 16
Alarme
Niveau Stop
Paragraphe 15
Alarme
Debit Off
Paragraphe 14
Configuration
Pompe fonctions
enter
Menu réglage
Paragraphe 9
Debit max
100 %
Langage
Francais
Paragraphe 10
Contact alarme
NO
Paragraphe 1
Pompe fonctions
Manuel <-
Menu fonction
Paragraphe 2
Pompe fonctions
0/4 - 20 mA
Paragraphe 3
Pompe fonctions
20 - 4/0 mA
Paragraphe 4
Pompe fonctions
Multiple (1:n)
Paragraphe 5
Pompe fonctions
Divise (n:1)
Paragraphe 8
Pompe fonctions
Temp
Paragraphe 7
Pompe fonctions
Mode ppm
Paragraphe 6
Pompe fonctions
Batch (1:c)

Programmation de la langue

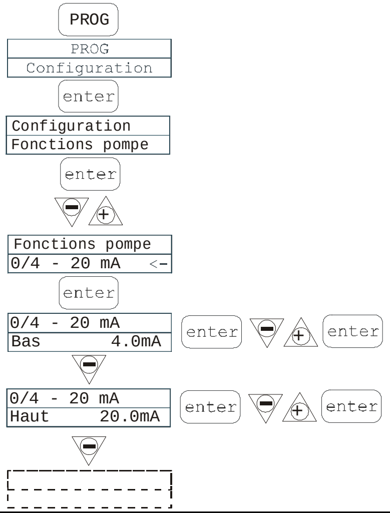
Programmation	Fonctionnement
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open Language English enter enter	Permet de sélectionner la langue, la pompe est programmée en usine en anglais. Appuyer sur mode enter pour accéder à la modification, puis sur les touches ⊕ ⊖ pour programmer la valeur. La touche mode enter confirme et permet de retourner au menu principal.

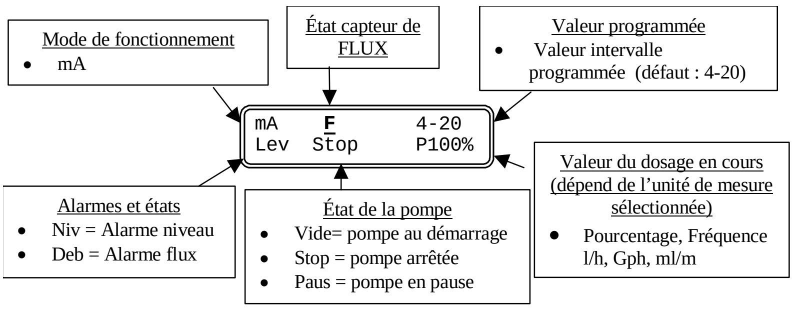
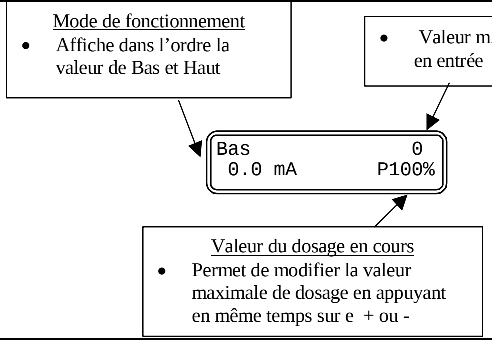
Paragraphe 1 –Dosage manuel

Programmation	Fonctionnement
 PROG PROG Configuration enter Configuration Fonctions pompe enter Fonctions pompe Manuel <- enter	La pompe travaille en mode constant et le débit peut être réglé uniquement en mode manuel en appuyant simultanément sur les touches mode enter ⊕ pour augmenter le débit ou sur les touches mode enter ⊖ pour le réduire.

Affichage pendant le fonctionnement	Affichage lors de la programmation (touche MODE)
 Mode de fonctionnement - Man = Manuelle État capteur de FLUX Valeur du dosage en cours (dépend de l'unité de mesure sélectionnée) - Pourcentage, Fréquence, l/h, Gph, ml/m Alarmes et états - Niv = Alarme niveau - Deb = Alarme flux État de la pompe - Vide= pompe au démarrage - Stop = pompe arrêtée - Paus = pompe en pause MAN F Niv Stop P100%	 Mode de fonctionnement - Affiche la valeur correspondante de la fréquence Valeur du dosage en cours - Modification du débit maximal en appuyant en même temps sur + ou - F320s/m P100%

Paragraphe 2 – Dosage Proportionnel sur signal 0/4-20 mA

Programmation	Fonctionnement
 PROG PROG Configuration enter Configuration Fonctions pompe enter Fonctions pompe 0/4 - 20 mA <- enter 0/4 - 20 mA Bas 4.0mA enter enter 0/4 - 20 mA Haut 20.0mA enter enter	La pompe dose proportionnellement sur un signal (0)4-20 mA. La programmation d'usine de la pompe prévoit l'interruption du dosage à 4 mA et le dosage à la fréquence maximale programmée lorsqu'elle reçoit 20 mA. En cours de programmation, il est possible de modifier ces deux valeurs. La fréquence maximale est modifiable pendant le fonctionnement en appuyant simultanément sur les touches mode enter ⊕ pour augmenter le débit ou sur les touches mode enter ⊖ pour le réduire.

Affichage pendant le fonctionnement	Affichage lors de la programmation (touche MODE)
	

mA F 4-20
Lev Stop P100%

Mode de fonctionnement
- mA

État capteur de FLUX

Valeur programmée
- Valeur intervalle programmée (défaut : 4-20)

Alarmes et états
- Niv = Alarme niveau
- Deb = Alarme flux

État de la pompe
- Vide= pompe au démarrage
- Stop = pompe arrêtée
- Paus = pompe en pause

Valeur du dosage en cours (dépend de l'unité de mesure sélectionnée)
- Pourcentage, Fréquence l/h, Gph, ml/m

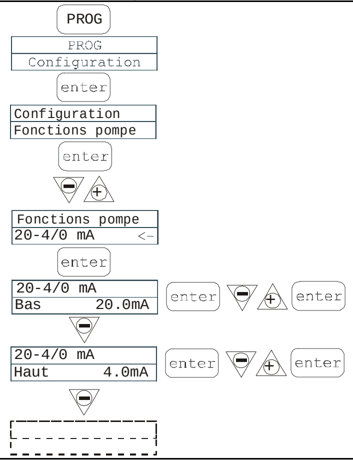
Bas 0
0.0 mA P100%

Mode de fonctionnement
- Affiche dans l'ordre la valeur de Bas et Haut

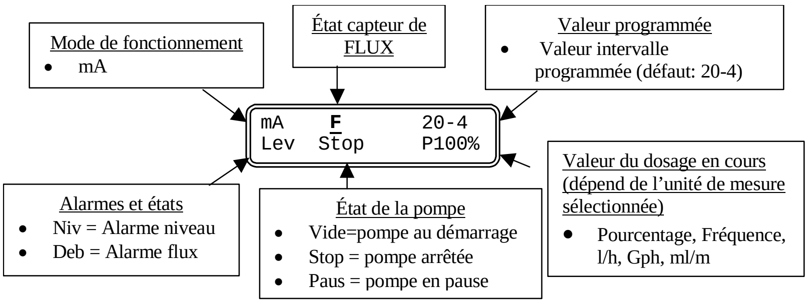
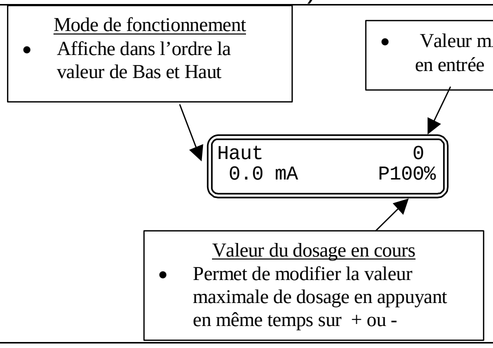
- Valeur mA en entrée

Valeur du dosage en cours
- Permet de modifier la valeur maximale de dosage en appuyant en même temps sur e + ou -

Paragraphe 3 – Dosage proportionnel sur signal 20-4/0 mA

Programmation	Fonctionnement
	La pompe dose proportionnellement sur un signal 20-4 (0) mA. La programmation d'usine de la pompe prévoit l'interruption du dosage à 20 mA et le dosage à la fréquence maximale programmée lorsqu'elle reçoit 4 mA. En cours de programmation, il est possible de modifier ces deux valeurs. La fréquence maximale est modifiable pendant le fonctionnement en appuyant simultanément sur les touches **mode enter** ⊕ pour augmenter le débit ou sur les touches **mode enter** ⊖ pour le réduire.

PROG
PROG
Configuration
enter
Configuration
Fonctions pompe
enter
Fonctions pompe
20-4/0 mA <-
enter
20-4/0 mA
Bas 20.0mA
enter
enter
20-4/0 mA
Haut 4.0mA
enter
enter

Affichage pendant le Fonctionnement	Affichage lors de la programmation (touche MODE)
	

mA F 20-4
Lev Stop P100%

Mode de fonctionnement
- mA

État capteur de FLUX

Valeur programmée
- Valeur intervalle programmée (défaut: 20-4)

Alarmes et états
- Niv = Alarme niveau
- Deb = Alarme flux

État de la pompe
- Vide=pompe au démarrage
- Stop = pompe arrêtée
- Paus = pompe en pause

Valeur du dosage en cours (dépend de l'unité de mesure sélectionnée)
- Pourcentage, Fréquence, l/h, Gph, ml/m

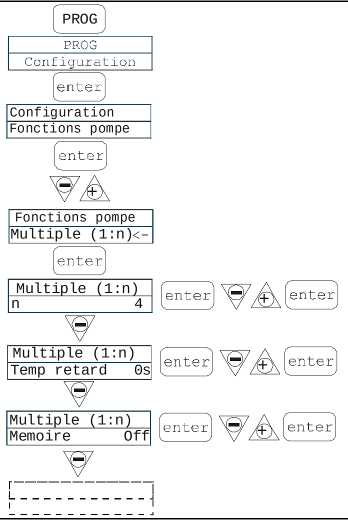
Haut 0
0.0 mA P100%

Mode de fonctionnement
- Affiche dans l'ordre la valeur de Bas et Haut

- Valeur mA en entrée

Valeur du dosage en cours
- Permet de modifier la valeur maximale de dosage en appuyant en même temps sur + ou -

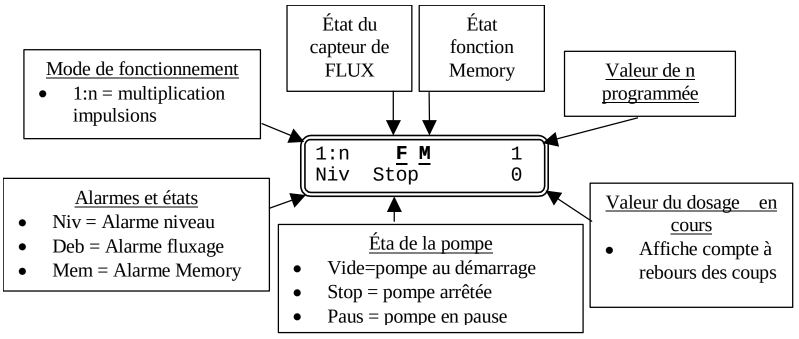
Paragraphe 4 – Proportionnel à des impulsions extérieures (multiplications)

Programmation	Fonctionnement
	La pompe dose proportionnellement à un signal extérieur (ex.: compteur de lancement d'impulsions). À chaque signal reçu, la pompe effectue les "n" coups programmés. La pompe programme automatiquement la fréquence de dosage, en l'adaptant au temps qui s'écoule entre deux signaux successifs. Il est possible de programmer en secondes le temps (timeout) outre lequel la pompe remet à zéro le comptage de l'intervalle, pour éviter des dosages dans des temps trop longs. La pompe dispose de la fonction mémoire qui signale la réception d'un signal durant le dosage. En la programmant sur Off, elle se limite à signaler, si elle est sur On, elle signale et mémorise les impulsions, puis elle les exécute lorsqu'elle cesse de recevoir des signaux. La valeur de "n" est modifiable durant la phase de fonctionnement en appuyant simultanément sur les touches **mode enter** ⊕ pour augmenter la valeur du débit ou sur les touches **mode enter** ⊖ pour la réduire.

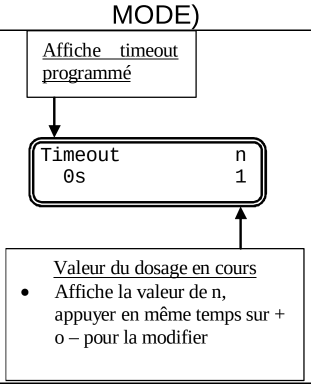
PROG
PROG
Configuration
enter
Configuration
Fonctions pompe
enter
Fonctions pompe
Multiple (1:n)<-
enter
Multiple (1:n)
n 4
enter
enter
Multiple (1:n)
Temp retard 0s
enter
enter
Multiple (1:n)
Memoire Off
enter
enter

Affichage durant le Fonctionnement

Affichage lors he MODE)

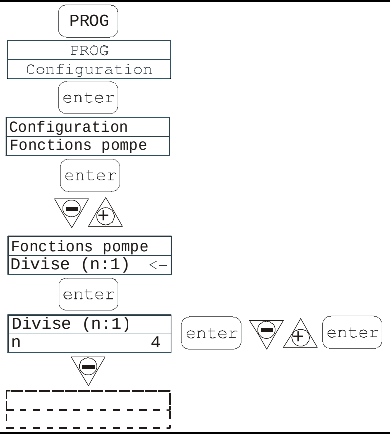


Mode de fonctionnement
1:n = multiplication impulsions
État du capteur de FLUX
État fonction Memory
Valeur de n programmée
1:n F M 1
Niv Stop 0
Alarmes et états
Niv = Alarme niveau
Deb = Alarme fluxage
Mem = Alarme Memory
Éta de la pompe
Vide=pompe au démarrage
Stop = pompe arrêtée
Paus = pompe en pause
Valeur du dosage en cours
Affiche compte à rebours des coups



Affiche timeout programmé
Timeout n
0s 1
Valeur du dosage en cours
Affiche la valeur de n, appuyer en même temps sur + o – pour la modifier

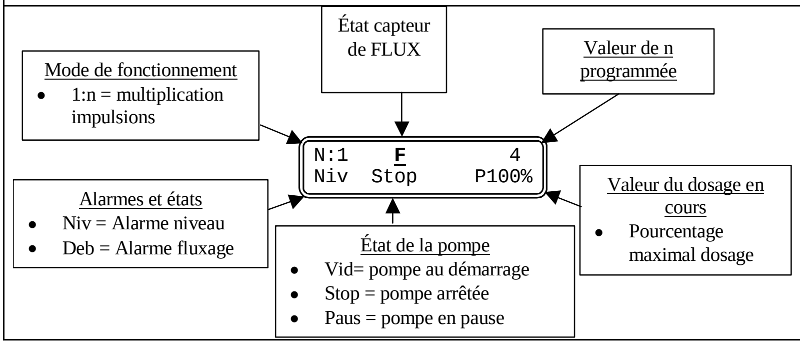
Paragraphe 5 – Proportionnel à impulsions extérieures (division)

Programmation	Fonctionnement
	La pompe dose proportionnellement à un signal extérieur (ex. : compteur de lacement d’impulsions). À chaque “n” signaux reçus, la pompe exécute un coup. Programmer la valeur de “n”. En programmant la valeur de “n“ on programme le % de dosage maximal, durant la phase de fonctionnement, il est possible de modifier cette valeur en appuyant simultanément sur les touches mode enter ⊕ pour l’augmenter ou sur les touches mode enter ⊖ pour la réduire.

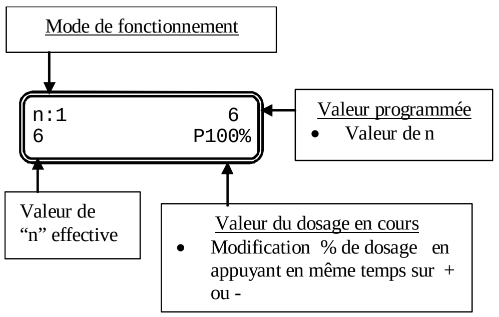
PROG
PROG
Configuration
enter
Configuration
Fonctions pompe
enter
Fonctions pompe
Divise (n:1) <-
enter
Divise (n:1)
n 4
enter
enter

Affichage pendant le fonctionnement

Affichage lors de la programmation (touche MODE)

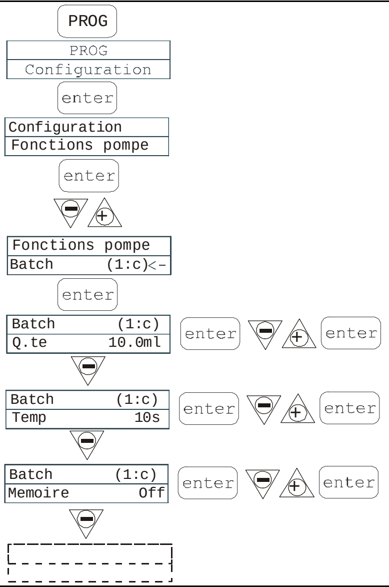


État capteur de FLUX
Mode de fonctionnement
1:n = multiplication impulsions
Valeur de n programmée
N:1 F 4
Niv Stop P100%
Alarmes et états
Niv = Alarme niveau
Deb = Alarme fluxage
État de la pompe
Vid= pompe au démarrage
Stop = pompe arrêtée
Paus = pompe en pause
Valeur du dosage en cours
Pourcentage maximal dosage



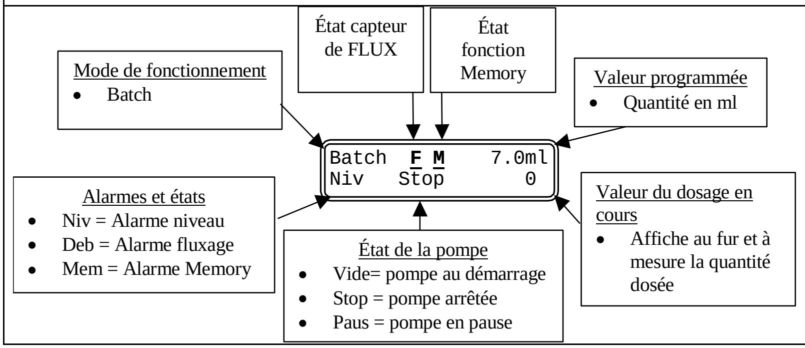
Mode de fonctionnement
n:1 6
6 P100%
Valeur programmée
Valeur de n
Valeur de “n” effective
Valeur du dosage en cours
Modification % de dosage en appuyant en même temps sur + ou -

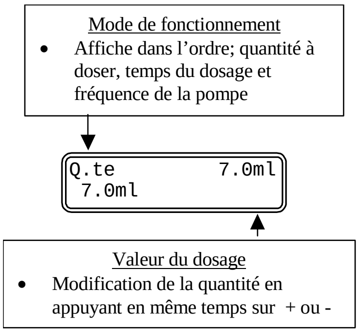
Paragraphe 6 – Proportionnel à impulsions extérieures (dosage Batch)

Programmation	Fonctionnement
	La pompe dose proportionnellement à un signal extérieur (ex : compteur de lancement d’impulsions). Dans ce cas, il est possible de programmer la quantité à doser en ml et l’intervalle dans les limites duquel compléter le dosage. Il est possible d’activer manuellement le dosage par la pression de la touche ⊕, ou à l’aide d’une commande déportée. La touche start stop, interrompt le dosage qui peut être remis à zéro en appuyant sur ⊕, ou redémarré en appuyant de nouveau sur start stop. La quantité à doser est modifiable durant la phase de fonctionnement en appuyant simultanément sur mode enter ⊕ pour augmenter le débit ou sur les touches mode enter ⊖ pour le réduire.

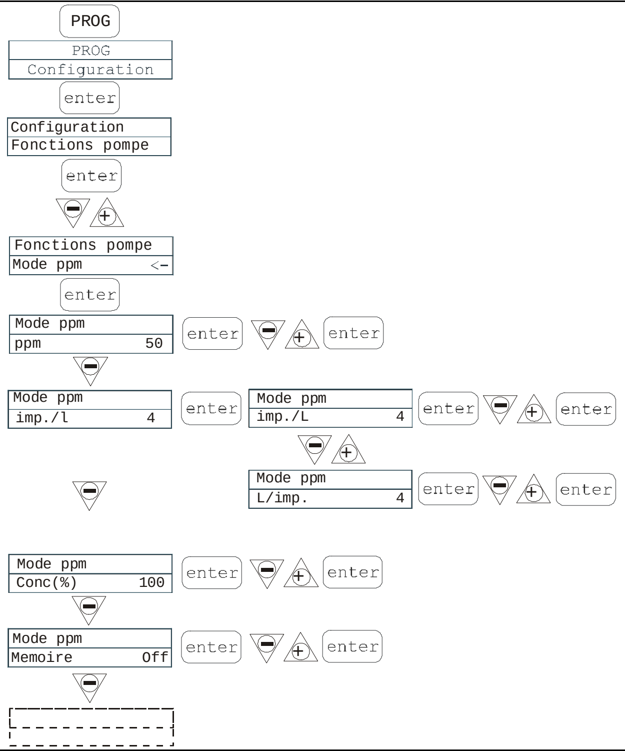
PROG
PROG
Configuration
enter
Configuration
Fonctions pompe
enter
Fonctions pompe
Batch (1:c)<-
enter
Batch (1:c)
Q.te 10.0ml
enter
enter
Batch (1:c)
Temp 10s
enter
enter
Batch (1:c)
Memoire Off
enter
enter

Affichage pendant le fonctionnement	Affichage lors c :he MODE)


État capteur de FLUX
État fonction Memory
Mode de fonctionnement
Batch
Valeur programmée
Quantité en ml
Batch F M 7.0ml
Niv Stop 0
Alarmes et états
Niv = Alarme niveau
Deb = Alarme fluxage
Mem = Alarme Memory
Valeur du dosage en cours
Affiche au fur et à mesure la quantité dosée
État de la pompe
Vide= pompe au démarrage
Stop = pompe arrêtée
Paus = pompe en pause

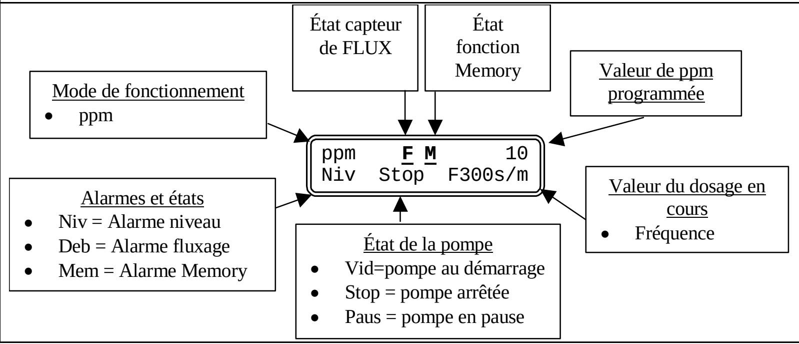

Mode de fonctionnement
Affiche dans l'ordre; quantité à doser, temps du dosage et fréquence de la pompe
Q.te 7.0ml
7.0ml
Valeur du dosage
Modification de la quantité en appuyant en même temps sur + ou -

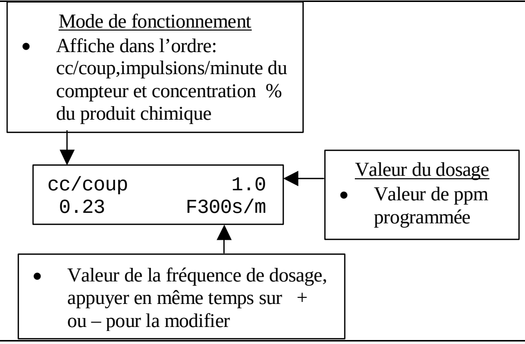
Paragraphe 7 – Proportionnel à impulsions extérieures (dosage en ppm)

Programmation	Fonctionnement
	La pompe dose proportionnellement à un signal extérieur (ex.: compteur de lancement d'impulsions) en calculant automatiquement le rapport entre les signaux entrant et les coups de la pompe en fonction de la valeur de ppm programmée. Les données à insérer sont la valeur de ppm., le rapport impulsions/litre (ou litres/impulsion) du compteur et la concentration du produit à doser. Durant la phase de fonctionnement il est possible de modifier la fréquence de dosage en appuyant simultanément sur mode enter ⊕ pour l'augmenter ou sur mode enter ⊖ pour la réduire.

PROG
PROG
Configuration
enter
Configuration
Fonctions pompe
enter
Fonctions pompe
Mode ppm <-
enter
Mode ppm
ppm 50
enter
enter
Mode ppm
imp./l 4
enter
Mode ppm
imp./L 4
enter
enter
Mode ppm
L/imp. 4
enter
enter
Mode ppm
Conc(%) 100
enter
enter
Mode ppm
Memoire Off
enter
enter

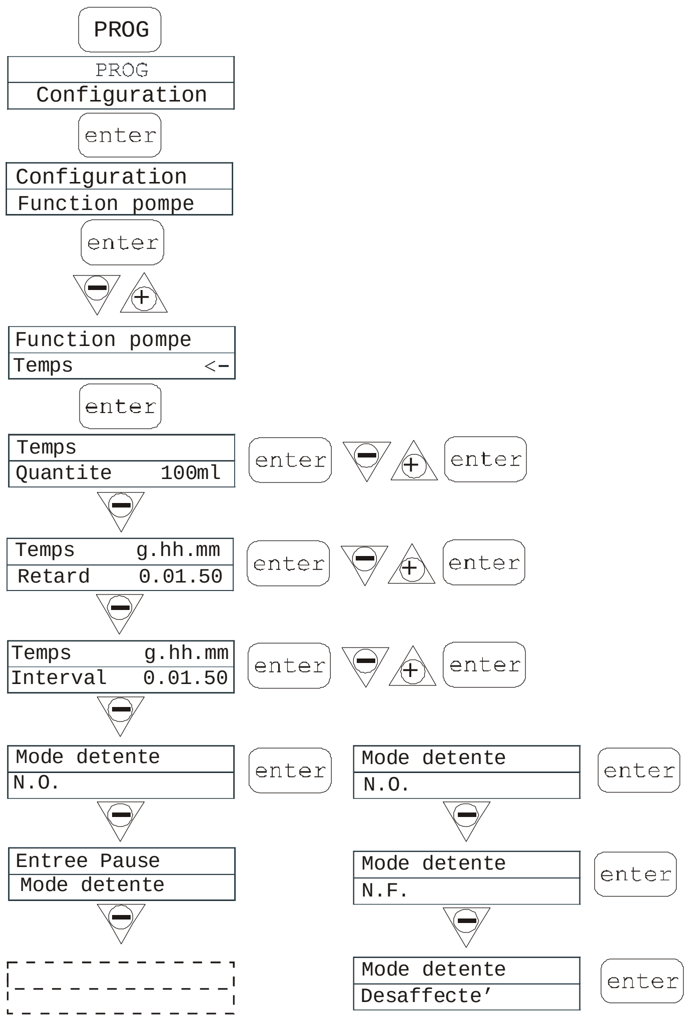
Affichage pendant le fonctionnement	Affichage lors de la programmation (touche MODE)


État capteur de FLUX
État fonction Memory
Mode de fonctionnement
ppm
Valeur de ppm programmée
ppm F M 10
Niv Stop F300s/m
Alarmes et états
Niv = Alarme niveau
Deb = Alarme fluxage
Mem = Alarme Memory
Valeur du dosage en cours
Fréquence
État de la pompe
Vid=pompe au démarrage
Stop = pompe arrêtée
Paus = pompe en pause


Mode de fonctionnement
Affiche dans l'ordre: cc/coup,impulsions/minute du compteur et concentration % du produit chimique
cc/coup 1.0
0.23 F300s/m
Valeur du dosage
Valeur de ppm programmée
Valeur de la fréquence de dosage, appuyer en même temps sur + ou – pour la modifier

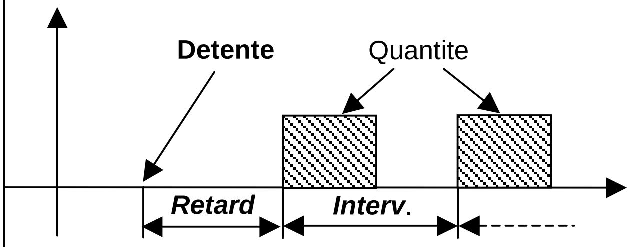
Paragraphe 8 – Dosage temporisé ***(Entrée signal fréquence* «Trigger» activé)**

Programmation

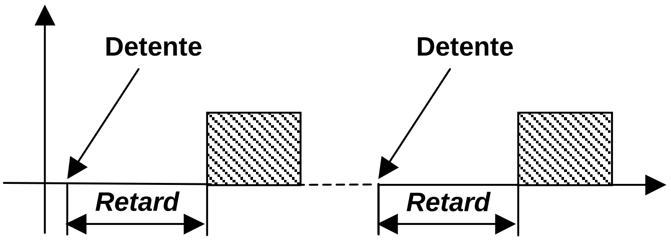

PROG
PROG
Configuration
enter
Configuration
Function pompe
enter
Function pompe
Temps <-
enter
Temps
Quantite 100ml
enter
enter
Temps g.hh.mm
Retard 0.01.50
enter
enter
Temps g.hh.mm
Interval 0.01.50
enter
enter
Mode detente
N.O.
enter
Mode detente
N.O.
enter
Mode detente
N.F.
enter
Mode detente
Desaffecte'
enter
Entree Pause
Mode detente

Fonctionnement

Après l'arrivée du signal de ***DETENTE*** réglé, la pompe dose une quantité programmable en ml. Il est possible de régler un temps de retard avant le dosage (***Retard***) et la distance entre les dosages successifs (***Interv***.), comme d'après le schéma:


Detente
Quantite
Retard
Interv.

En réglant, par exemple, un temps ***Interv***. = 0 on obtient un système dosant la quantité programmée après chaque signal de ***DETENTE*** (avec l'éventuel retard réglé):


Detente
Detente
Retard
Retard

Il est possible de faire démarrer le dosage même en appuyant sur la touche +, simulant pratiquement le signal de ***Detente.***

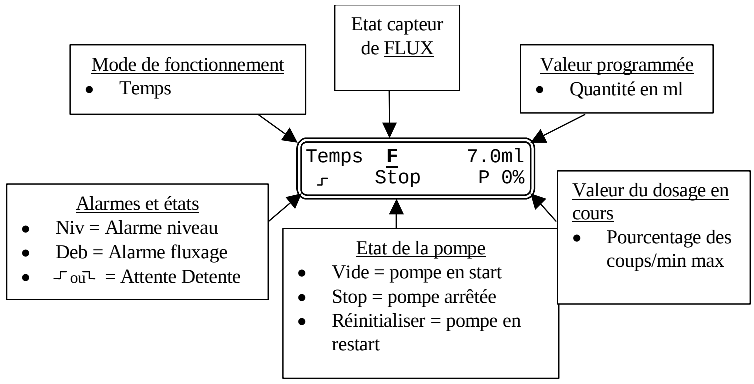
Le signal ***Detente*** peut être réglé ***NO*** (il s'active lorsque l'entrée passe du mode ouvert au mode fermé) ou ***NF*** (il s'active lorsque l'entrée passe du mode fermé au mode ouvert).

Le signal ***Detente*** est bloqué pendant le dosage (son arrivée n'est ni mémorisée ni gérée).

L'entrée ***Pause*** (***Entrée commande à distance)*** ne peut pas être programmée et son activation bloque le dosage, tandis que la désactivation successive remet le système en attente du signal ***Detente*** pour un nouveau dosage.

Pendant la phase de fonctionnement de la pompe, il est possible de modifier la fréquence du dosage, en appuyant en même temps sur les touches mode enter ⊕ pour augmenter la fréquence, ou bien sur les touches mode enter ⊖ pour la diminuer.

Visualisation pendant le fonctionnement


Temps F 7.0ml
Stop P 0%

Mode de fonctionnement
- Temps

Etat capteur de FLUX

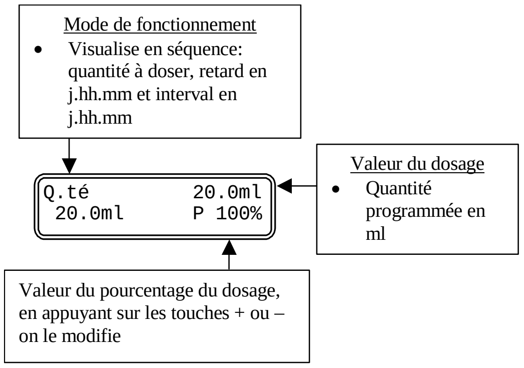
Valeur programmée
- Quantité en ml

Alarmes et états
- Niv = Alarme niveau
- Deb = Alarme fluxage
- ⎍ ou ⎍ = Attente Detente

Etat de la pompe
- Vide = pompe en start
- Stop = pompe arrêtée
- Réinitialiser = pompe en restart

Valeur du dosage en cours
- Pourcentage des coups/min max

Visualisation en démarche (touche MODE)


Q.té 20.0ml
20.0ml P 100%

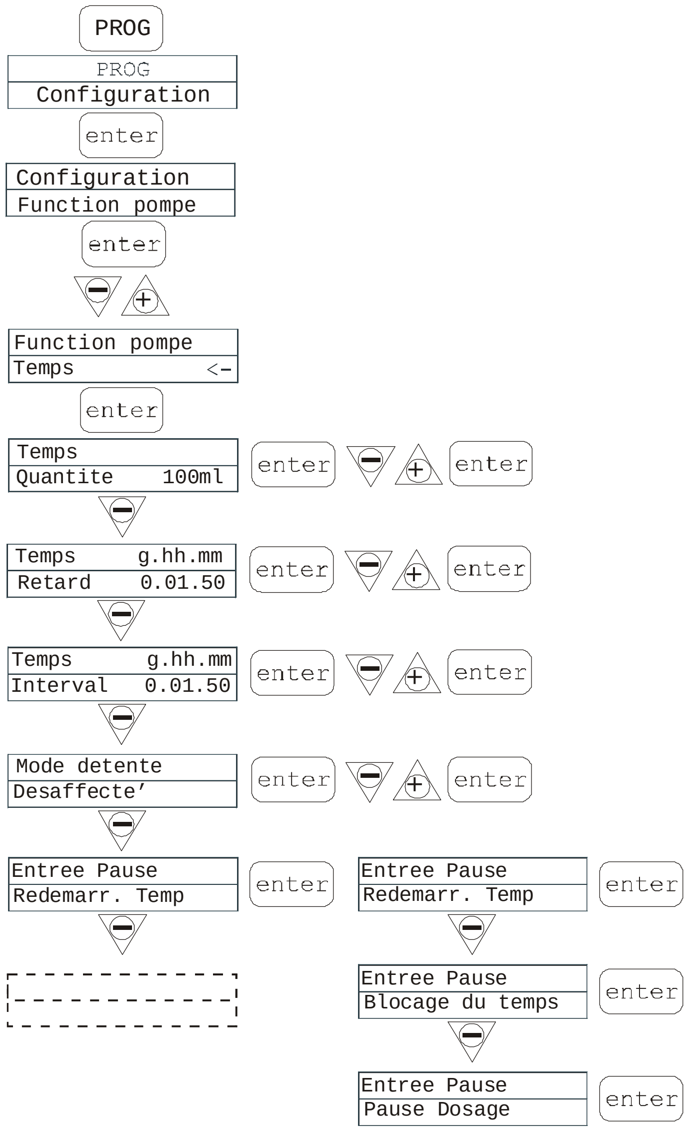
Mode de fonctionnement
- Visualise en séquence: quantité à doser, retard en j.hh.mm et interval en j.hh.mm

Valeur du dosage
- Quantité programmée en ml

Valeur du pourcentage du dosage, en appuyant sur les touches + ou – on le modifie

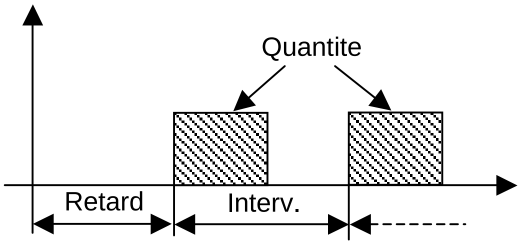
Paragraphe 8 – Dosage temporisé ***(Entrée signal fréquence* «Trigger» non activé)**

Programmation


PROG
PROG
Configuration
enter
Configuration
Function pompe
enter
Function pompe
Temps <–
enter
Temps
Quantite 100ml
enter
enter
Temps g.hh.mm
Retard 0.01.50
enter
enter
Temps g.hh.mm
Interval 0.01.50
enter
enter
Mode detente
Desaffecte'
enter
enter
Entree Pause
Redemarr. Temp
enter
Entree Pause
Redemarr. Temp
enter
Entree Pause
Blocage du temps
enter
Entree Pause
Pause Dosage
enter

Fonctionnement

La pompe dose une quantité programmable en ml, il est possible de régler un temps de retard au démarrage de la pompe (***Retard***) et la distance entre deux dosages successifs (***Interv***.), comme d'après le schéma:


Quantite
Retard
Interv.

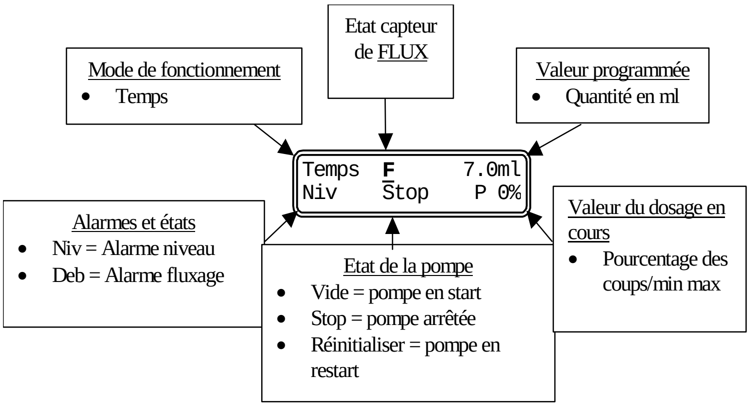
Les temps de ***Retard*** et ***Interv***. sont en jj.hh.mm (jours.heures.minutes)

L'entrée ***Pause*** peut être programmée en trois modes différents:

1. ***Blocage du temps***: avec la pause activée, le système bloque le comptage du temps actuel qui reprend quand la pause se désactive
2. ***Pause Dosage***: avec la pause activée, le système continue à compter le temps et bloque le dosage
3. ***Redemarr. Temp***: avec la pause activée, le système bloque le dosage, quand la pause se désactive le comptage recommence dès le début.

Pendant la phase de fonctionnement de la pompe, il est possible de modifier la fréquence du dosage, en appuyant en même temps sur les touches mode enter ⊕ pour augmenter la fréquence, ou bien sur les touches mode enter ⊖ pour la diminuer.

Visualisation pendant le fonctionnement


Temps F 7.0ml
Niv Stop P 0%

Etat capteur de FLUX

Mode de fonctionnement
- Temps

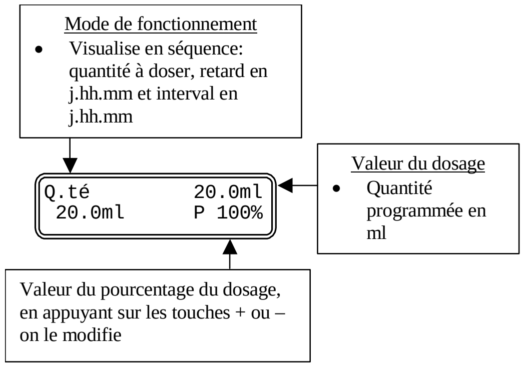
Valeur programmée
- Quantité en ml

Alarmes et états
- Niv = Alarme niveau
- Deb = Alarme fluxage

Etat de la pompe
- Vide = pompe en start
- Stop = pompe arrêtée
- Réinitialiser = pompe en restart

Valeur du dosage en cours
- Pourcentage des coups/min max

Visualisation en démarche (touche MODE)

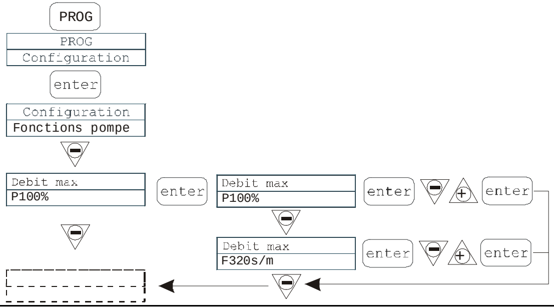

Q.té 20.0ml
20.0ml P 100%

Mode de fonctionnement
- Visualise en séquence: quantité à doser, retard en j.hh.mm et interval en j.hh.mm

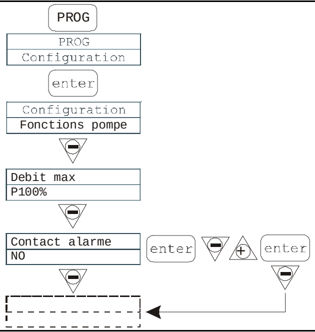
Valeur du dosage
- Quantité programmée en ml

Valeur du pourcentage du dosage, en appuyant sur les touches + ou – on le modifie

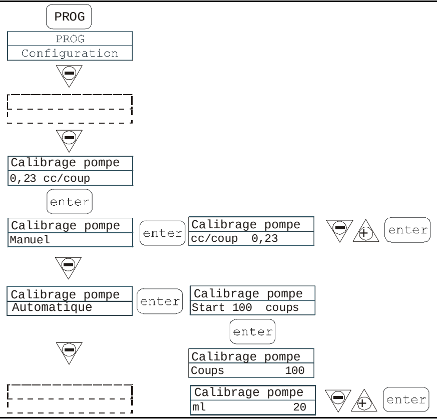
Paragraphe 9 – Programmation débit maximal

Programmation	Fonctionnement
 PROG PROG Configuration enter Configuration Fonctions pompe Debit max P100% enter Debit max P100% enter enter Debit max F320s/m enter enter	Permet de programmer le débit maximal pouvant être atteint par la pompe et le mode programmé (% ou fréquence) devient l'affichage du débit dans l'unité de mesure standard. Appuyer sur mode enter pour accéder à la modification puis sur les touches ⊕ ⊖ pour programmer la valeur- Avec mode enter confirmer et retourner au menu principal.

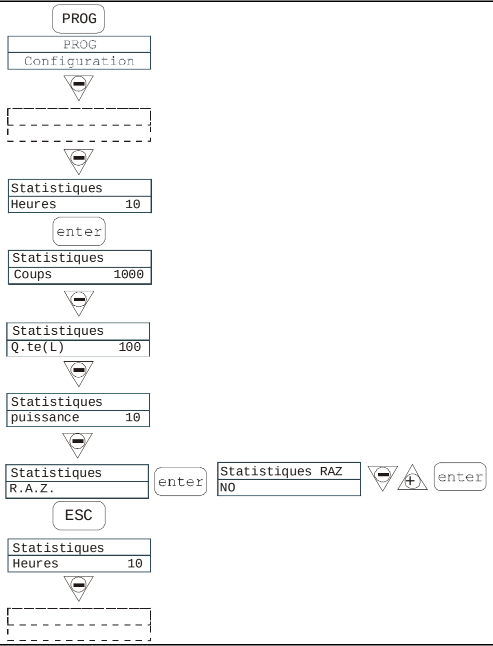
Paragraphe 10 – Programmation du relais d'alarme

Programmation	Fonctionnement
 PROG PROG Configuration enter Configuration Fonctions pompe Debit max P100% Contact alarme NO enter enter	En l'absence d'une situation d'alarme, il peut être programmé ouvert (usine) ou fermé. Appuyer sur mode enter pour accéder à la modification puis avec les touches ⊕ ⊖ programmer la valeur. Avec mode enter confirmer et retourner au menu principal.

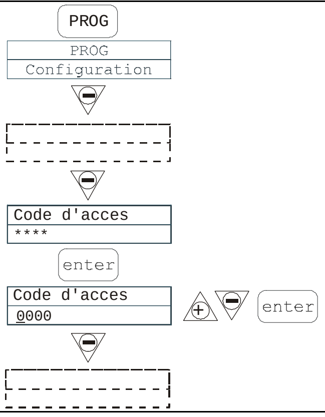
Paragraphe 11 – Calibrage du débit

Programmation	Fonctionnement
 PROG PROG Configuration Calibrage pompe 0,23 cc/coup enter Calibrage pompe Manuel enter Calibrage pompe cc/coup 0,23 enter Calibrage pompe Automatique enter Calibrage pompe Start 100 coups enter Calibrage pompe Coups 100 Calibrage pompe ml 20 enter	Le menu principal affiche la valeur de cc par coup en mémoire. Il est possible de calibrer en deux modes : MANUEL – insérer manuellement la valeur en cc par coup avec les touches ⊕ ⊖ et confirmer avec mode enter AUTOMATIQUE – la pompe exécute 100 coups qui sont activés avec la touche mode enter, une fois terminés, insérer la quantité aspirée par la pompe avec les touches ⊕ ⊖ et confirmer avec mode enter. La donnée insérée sera utilisée dans les calculs des débits

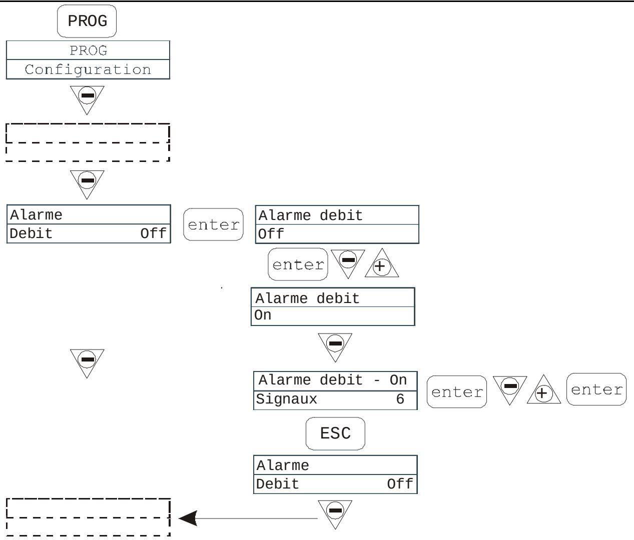
Paragraphe 12 – Statistiques

Programmation	Fonctionnement
 PROG PROG Configuration Statistiques Heures 10 enter Statistiques Coups 1000 Statistiques Q.te(L) 100 Statistiques puissance 10 Statistiques R.A.Z. enter Statistiques RAZ NO enter ESC Statistiques Heures 10	Le menu principal affiche les heures de fonctionnement de la pompe, appuyer sur mode enter pour accéder aux autres statistiques. - Strokes = nombre de coups exécutés par la pompe - Q.ty(L) = quantité dosée par la pompe exprimée en litres; cette donnée est calculée d'après la valeur cc/stroke en mémoire - Power = nombre de démarrages de la pompe - Reset = les touches ⊖ permettent de réinitialiser les compteurs (YES) ou non (NO), appuyer sur mode enter pour confirmer. La pression de esc permet de retourner au menu principal.

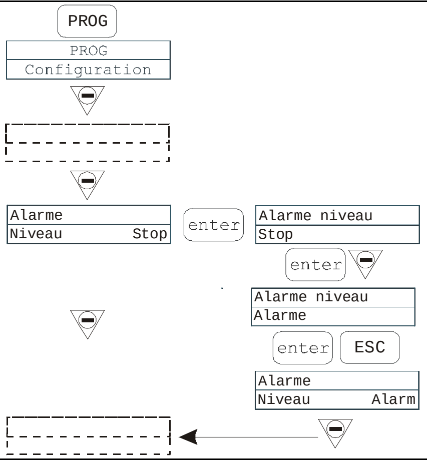
Paragraphe 13 – Password

Programmation	Fonctionnement
 PROG PROG Configuration Code d'acces **** enter Code d'acces 0000 enter	Entrer le mot de passe pour entrer dans la programmation et voir toutes les valeurs programmées, le mot de passe sera demandé à chaque tentative de modification La ligne clignotante indique le nombre modifiable, avec la touche ⊕ sélectionner le nombre (de 1à 9), avec la touche ⊖ sélectionner le nombre à modifier puis avec la touche mode enter confirmer. En programmant “0000” (défaut), le mot de passe est exclu.

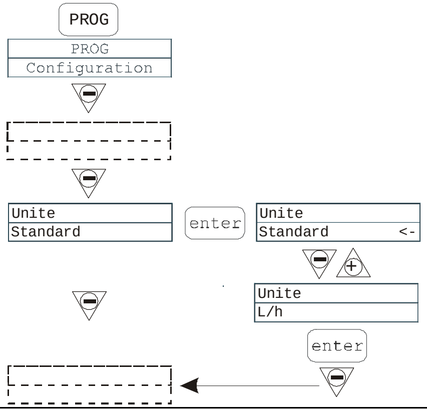
Paragraphe 14 – Alarme de flux

Programmation	Fonctionnement
 PROG PROG Configuration Alarme Debit Off enter Alarme debit Off enter Alarme debit On Alarme debit - On Signaux 6 enter enter ESC Alarme Debit Off	Permet d’activer (Désactiver) le capteur de flux. Une fois activé (On) appuyer sur la touche ⊖ pour accéder à la demande de combien de signaux la pompe attend avant de déclencher l’état d’alarme. En appuyant sur mode enter le nombre clignote, puis avec les touches ⊕ ⊖ programmer la valeur. Avec mode enter confirmer. Appuyer sur esc pour retourner au menu principal

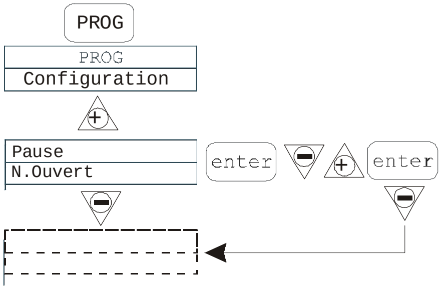
Paragraphe 15 – Alarme de niveau

Programmation	Fonctionnement
 PROG PROG Configuration Alarme Niveau Stop enter Alarme niveau Stop enter Alarme niveau Alarme enter ESC Alarme Niveau Alarm	Permet de programmer la pompe lorsque l’alarme du capteur de niveau s’active, à savoir si bloquer le dosage (Stop) ou si tout simplement activer la signalisation d’alarme sans bloquer le dosage. Appuyer sur mode enter pour accéder à la modification. Puis avec les touches ⊕ ⊖ programmer le type d’alarme. Avec mode enter confirmer. Appuyer sur esc pour retourner au menu principal.

Paragraphe 16 – Unité affichage débit

Programmation	Fonctionnement
 PROG PROG Configuration Unite Standard enter Unite Standard <- Unite L/h enter	Permet de programmer l'unité de mesure du dosage sur l'afficheur. Appuyer sur mode enter pour accéder à la modification, puis appuyer sur ⊕ ⊖ pour programmer le type d'unité de mesure, L/h (Litres/heure), Gph (Gallons/heure), ml/m (millilitres/minute) ou standard (% ou fréquence selon la programmation), Appuyer sur mode enter pour confirmer et retourner au menu principal

Paragraphe 17 - Programmation Pause

Programmation	Fonctionnement
 PROG PROG Configuration Pause N.Ouvert enter enter	Entrée signal pour mettre la pompe en pause. Le système est réglé d'usine en Normalement Ouvert. Appuyer sur mode enter pour accéder à la modification puis avec les touches ⊕ ⊖ programmer la valeur (N. OUVERT ou N. FERME'). Avec mode enter confirmer et retourner au menu principal.

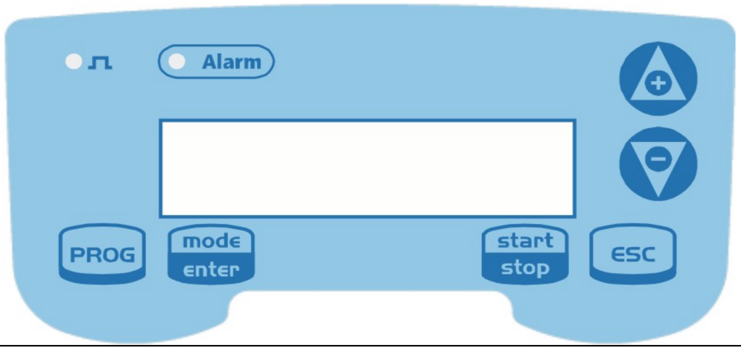
Régulation contraste affichage

Pour la régulation du contraste de l'affichage tenir appuyée la touche ESC et dans 5 secondes appuyer sur les touches ⊕ ou ⊖ pour augmenter ou diminuer le contraste.

Alarmes

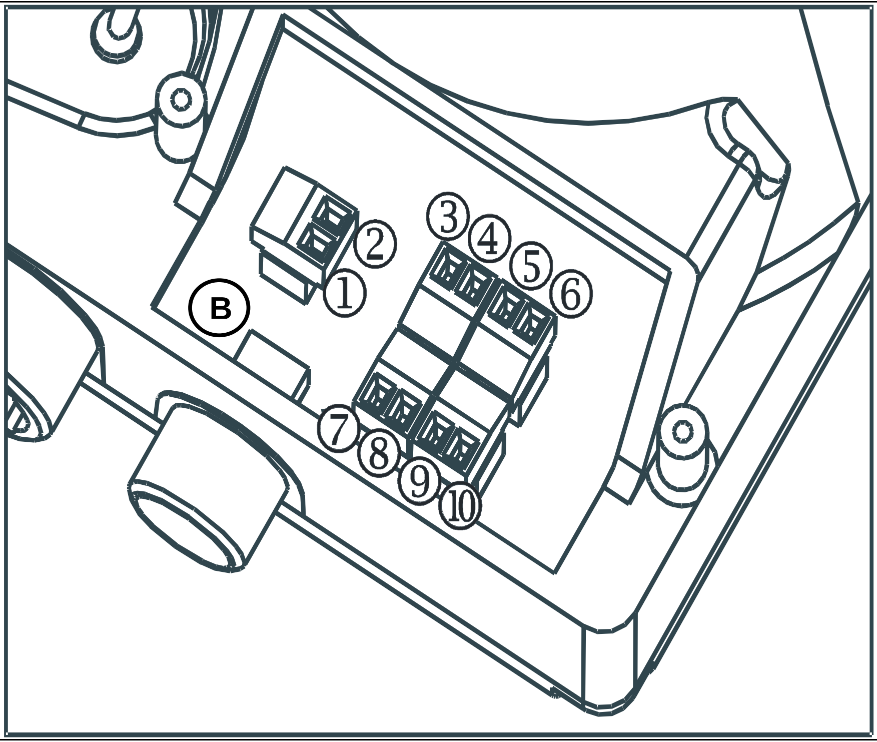
Affichage	Cause	Interruption
Led Alarme fixe Message lev clignotant Ex: `Man` `Lev P100%`	Alarme fin de niveau, sans interruption du fonctionnement de la pompe	Rétablissement du niveau du liquide
Led Alarme fixe Message lev et stop clignotant Ex: `Man` `Lev Stop P100%`	Alarme fin de niveau, avec interruption du fonctionnement de la pompe	Rétablissement du niveau du liquide
Message Mem clignotant Ex: `1:n 6` `Mem`	La pompe reçoit une ou plusieurs impulsions durant le dosage avec la fonction Mémoire sur Off	Pression de la touche start stop
Message Mem clignotant Ex: `1:n M 6` `Mem`	La pompe reçoit une ou plusieurs impulsions durant le dosage avec la fonction Mémoire sur On	Lorsque la pompe cesse de recevoir les impulsions extérieures, elle rend les coups mémorisés.
Led Alarme fixe Message Flw clignotant Ex: `Man F` `Flw P100%`	Alarme de flux active, la pompe n'a pas reçu le nombre de signaux programmés par le capteur de flux.	Pression de la touche start stop
Ex: `Parameter Error` `PROG to default`	Erreur de communication interne de l'UC.	Pression de la touche PROG pour rétablir les paramètres de défaut.

Pannello di controllo – TEKNA TPG



PROG	Accesso al menu di programmazione.
mode enter	Durante la fase di funzionamento della pompa: premuto visualizza ciclicamente sul display i valori programmati; Premuto contemporaneamente ai pulsanti ⊕ ⊖ aumenta o decrementa un valore dipendente dalla modalità di funzionamento prescelta. In programmazione svolge la funzione “enter”, cioè conferma l’ingresso nei vari livelli di menu e le modifiche all’interno degli stessi.
start stop	Avvia e mette in fase di stop la pompa. Nelle condizioni di allarme di livello (sola funzione allarme), di flusso e memory attive, disattiva la segnalazione sul display.
ESC	Per “uscire” dai vari livelli di menu. Prima di uscire definitivamente dalla programmazione si accede alla richiesta di salvataggio delle modifiche.
⊕	Scorre i menu verso l’alto, oppure incrementa i valori numerici da modificare. Nella modalità Batch può avviare il dosaggio.
⊖	Scorre i menu verso il basso, oppure decrementa i valori numerici da modificare.
⎍ ●	Led verde lampeggiante durante il dosaggio.
Alarm ●	Led rosso che si accende nelle varie situazioni d’allarme.

Connessioni elettriche



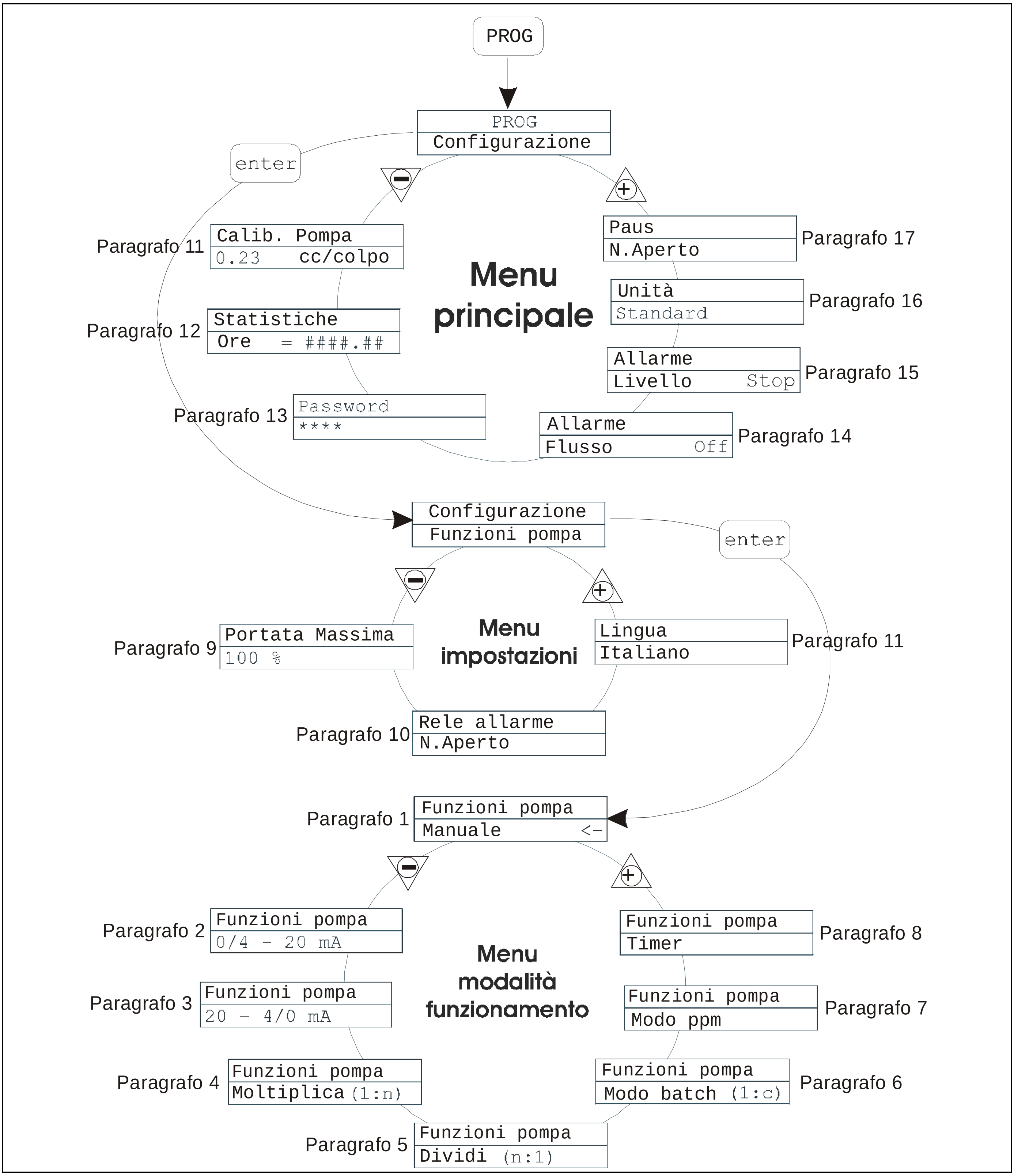
1	Relè d’allarme	
2		
3	Polo +	Ingresso 4-20 mA Impedenza d’ingresso: 200 ohm
4	Polo –	
5	-Ingresso controllo remoto (start-stop) -Ingresso segnale Pausa	
6		
7	-Ingressi segnale in frequenza (contatore lancia-impulsi) -Ingresso trigger esterno	
8		
9	Ingressi sensore di flusso	
10		
B	Ingresso sonda controllo livello	

Menu di Programmazione Tekna TPG

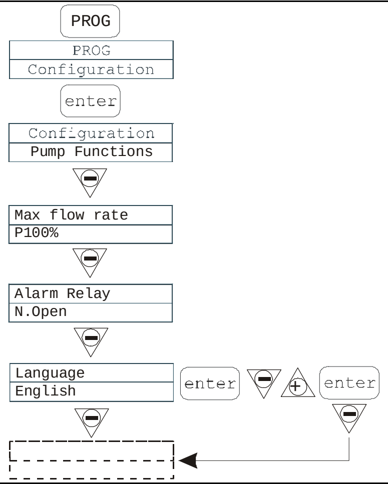
Premendo il tasto PROG per più di tre secondi si accede alla programmazione. Con i tasti ⊕ ⊖ potrete scorrere le voci del menu, con il pulsante mode enter si accede alle modifiche.
Di fabbrica la pompa è programmata in modalità costante. La pompa torna automaticamente nella modalità di funzionamento dopo 1 minuto di non attività. I questo caso dati eventualmente inseriti non vengono salvati.

Con il pulsante esc si esce dai livelli della programmazione. All'uscita dalla programmazione il display visualizza:

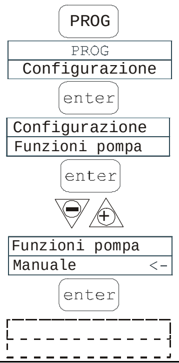
Exit No Save	∇ ∆	Exit Save	mode enter per confermare la scelta

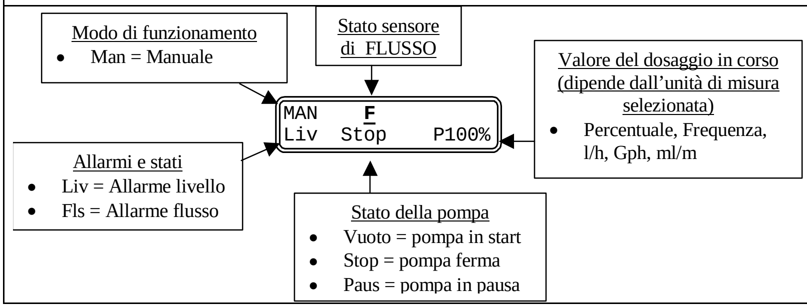
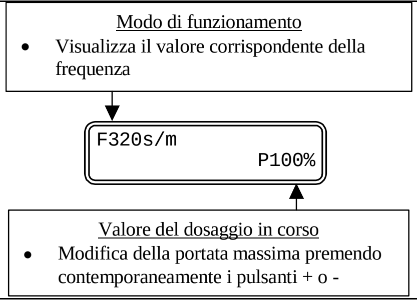

PROG
PROG Configurazione
enter
Menu principale
Paragrafo 11 Calib. Pompa 0.23 cc/colpo
Paragrafo 12 Statistiche Ore = ####.##
Paragrafo 13 Password ****
Paragrafo 17 Paus N.Aperto
Paragrafo 16 Unità Standard
Paragrafo 15 Allarme Livello Stop
Paragrafo 14 Allarme Flusso Off
Configurazione Funzioni pompa
enter
Menu impostazioni
Paragrafo 9 Portata Massima 100 %
Paragrafo 11 Lingua Italiano
Paragrafo 10 Rele allarme N.Aperto
Paragrafo 1 Funzioni pompa Manuale <-
Menu modalità funzionamento
Paragrafo 2 Funzioni pompa 0/4 - 20 mA
Paragrafo 3 Funzioni pompa 20 - 4/0 mA
Paragrafo 4 Funzioni pompa Moltiplica (1:n)
Paragrafo 5 Funzioni pompa Dividi (n:1)
Paragrafo 6 Funzioni pompa Modo batch (1:c)
Paragrafo 7 Funzioni pompa Modo ppm
Paragrafo 8 Funzioni pompa Timer

Impostazione lingua

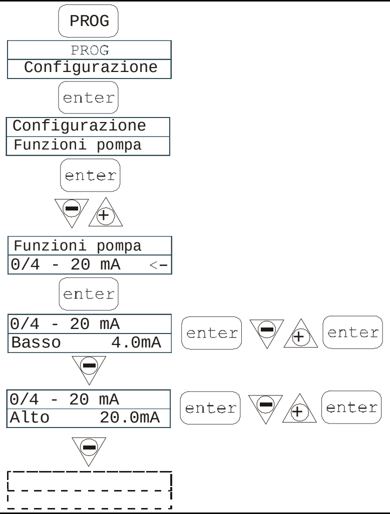
Programmazione	Funzionamento
 PROG PROG Configuration enter Configuration Pump Functions Max flow rate P100% Alarm Relay N.Open Language English enter enter	Permette di selezionare la lingua, di fabbrica la pompa è impostata in inglese. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il valore. Con mode enter confermo e torno al menu principale

Paragrafo 1 –Dosaggio manuale

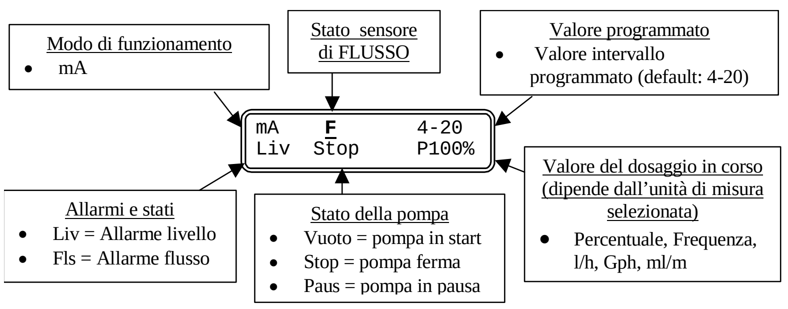
Programmazione	Funzionamento
 PROG PROG Configurazione enter Configurazione Funzioni pompa enter Funzioni pompa Manuale <- enter	La pompa lavora in modalità costante. La portata è regolata manualmente premendo contemporaneamente i pulsanti mode enter ⊕ per aumentare il valore della portata, oppure i pulsanti mode enter ⊖ per diminuirlo.

Visualizzazione durante il funzionamento	Visualizzazione in impostazione (tasto MODE)
 MAN F Liv Stop P100%Modo di funzionamento - Man = Manuale Stato sensore di FLUSSO Valore del dosaggio in corso (dipende dall'unità di misura selezionata) - Percentuale, Frequenza, l/h, Gph, ml/m Allarmi e stati - Liv = Allarme livello - Fls = Allarme flusso Stato della pompa - Vuoto = pompa in start - Stop = pompa ferma - Paus = pompa in pausa	 F320s/m P100%Modo di funzionamento - Visualizza il valore corrispondente della frequenza Valore del dosaggio in corso - Modifica della portata massima premendo contemporaneamente i pulsanti + o -

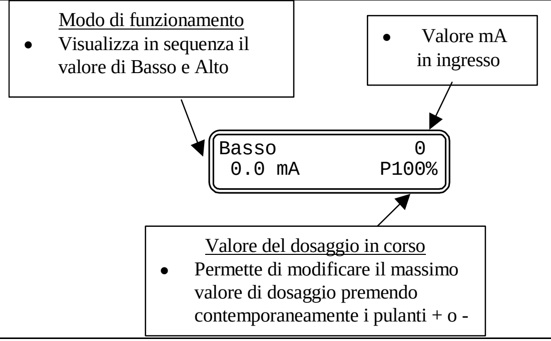
Paragrafo 2 – Dosaggio Proporzionale a segnale 0/4-20 mA

Programmazione	Funzionamento
 PROG PROG Configurazione enter Configurazione Funzioni pompa enter Funzioni pompa 0/4 - 20 mA <- enter 0/4 - 20 mA Basso 4.0mA enter enter 0/4 - 20 mA Alto 20.0mA enter enter	La pompa dosa proporzionalmente ad un segnale (0)4-20 mA. Di fabbrica la pompa interrompe il dosaggio a 4 mA e dosa alla massima frequenza impostata quando riceve 20 mA. In programmazione è possibile modificare questi due valori. La frequenza massima è modificabile durante il funzionamento, premendo contemporaneamente i tasti mode enter ⊕ per aumentare la portata, oppure i pulsanti mode enter ⊖ per diminuirla.

Visualizzazione durante il funzionamento

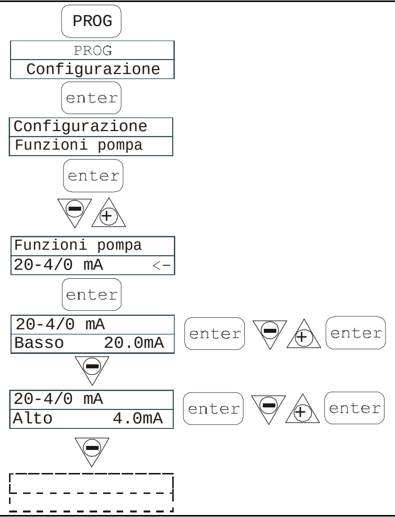

Modo di funzionamento
mA
Stato sensore di FLUSSO
Valore programmato
Valore intervallo programmato (default: 4-20)
mA F 4-20
Liv Stop P100%
Valore del dosaggio in corso (dipende dall'unità di misura selezionata)
Percentuale, Frequenza, l/h, Gph, ml/m
Allarmi e stati
Liv = Allarme livello
Fls = Allarme flusso
Stato della pompa
Vuoto = pompa in start
Stop = pompa ferma
Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


Modo di funzionamento
Visualizza in sequenza il valore di Basso e Alto
Valore mA in ingresso
Basso 0
0.0 mA P100%
Valore del dosaggio in corso
Permette di modificare il massimo valore di dosaggio premendo contemporaneamente i pulanti + o -

Paragrafo 3 – Dosaggio Proporzionale a segnale 20-4/0 mA

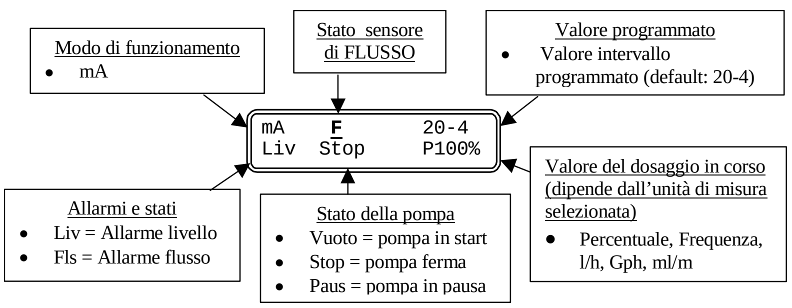
Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
20-4/0 mA <-
enter
20-4/0 mA
Basso 20.0mA
enter
enter
20-4/0 mA
Alto 4.0mA
enter
enter

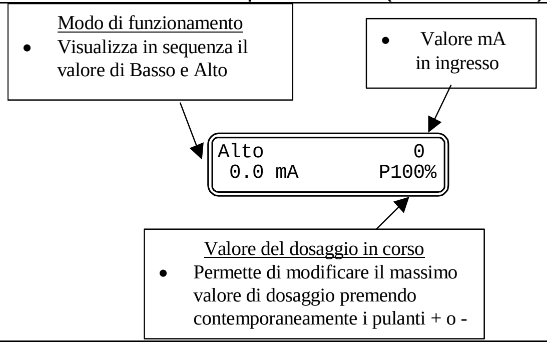
Funzionamento

La pompa dosa proporzionalmente ad un segnale 20-4(0) mA. Di fabbrica la pompa interrompe il dosaggio a 20 mA e dosa alla massima frequenza impostata quando riceve 4 mA. In programmazione è possibile modificare questi due valori. La frequenza massima è modificabile durante la fase di funzionamento premendo contemporaneamente i tasti mode enter ⊕ per aumentare la portata, oppure i pulsanti mode enter ⊖ per diminuirla.

Visualizzazione durante il funzionamento

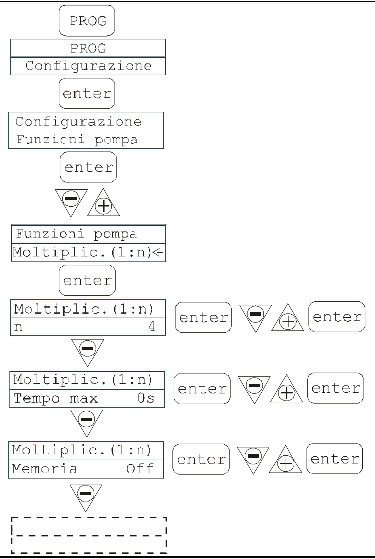

Modo di funzionamento
mA
Stato sensore di FLUSSO
Valore programmato
Valore intervallo programmato (default: 20-4)
mA F 20-4
Liv Stop P100%
Valore del dosaggio in corso (dipende dall'unità di misura selezionata)
Percentuale, Frequenza, l/h, Gph, ml/m
Allarmi e stati
Liv = Allarme livello
Fls = Allarme flusso
Stato della pompa
Vuoto = pompa in start
Stop = pompa ferma
Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


Modo di funzionamento
Visualizza in sequenza il valore di Basso e Alto
Valore mA in ingresso
Alto 0
0.0 mA P100%
Valore del dosaggio in corso
Permette di modificare il massimo valore di dosaggio premendo contemporaneamente i pulanti + o -

Paragrafo 4 – Proporzionale ad impulsi esterni (moltiplicazione)

Programmazione

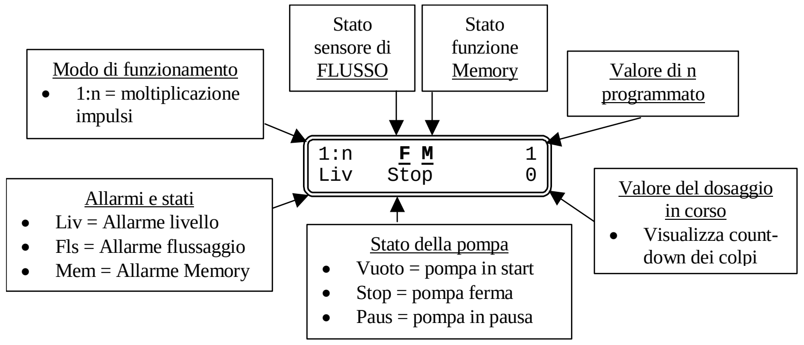

PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Moltiplic.(1:n)<
enter
Moltiplic.(1:n)
n 4
enter
enter
Moltiplic.(1:n)
Tempo max 0s
enter
enter
Moltiplic.(1:n)
Memoria Off
enter
enter

Funzionamento

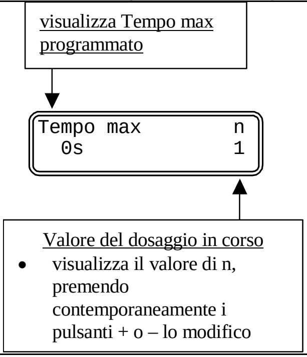
La pompa dosa proporzionalmente ad un segnale esterno (es.: contatore lanciaimpulsi). Ad ogni segnale ricevuto la pompa effettua gli "n" colpi programmati. La pompa imposta automaticamente la frequenza di dosaggio, adattandola al tempo che intercorre fra due segnali successivi. È possibile programmare in secondi il tempo (timeout) oltre il quale la pompa azzera il conteggio dell'intervallo, per evitare dosaggi in tempi troppo lunghi. La pompa dispone della funzione memory, che segnala il ricevimento di un segnale durante il dosaggio. Se impostata in Off si limita a segnalare, se in On segnala e memorizza gli impulsi, quindi li esegue quando smette di ricevere segnali.

Il valore di "n" è modificabile durante la fase di funzionamento premendo contemporaneamente i tasti mode enter ⊕ per incrementare il valore della portata, oppure i pulsanti mode enter ⊖ per decrementarlo.

Visualizzazione durante il funzionamento

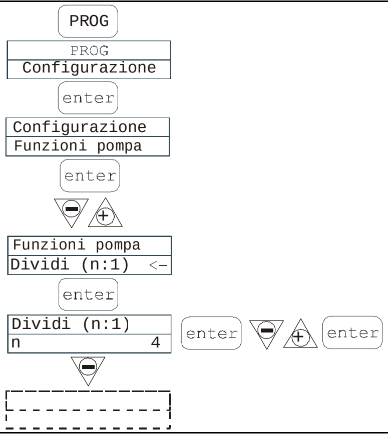

Stato sensore di FLUSSO
Stato funzione Memory
Modo di funzionamento
• 1:n = moltiplicazione impulsi
Valore di n programmato
1:n F M 1
Liv Stop 0
Allarmi e stati
• Liv = Allarme livello
• Fls = Allarme flussaggio
• Mem = Allarme Memory
Valore del dosaggio in corso
• Visualizza count-down dei colpi
Stato della pompa
• Vuoto = pompa in start
• Stop = pompa ferma
• Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


visualizza Tempo max programmato
Tempo max n
0s 1
Valore del dosaggio in corso
• visualizza il valore di n, premendo contemporaneamente i pulsanti + o – lo modifico

Paragrafo 5 – Proporzionale ad impulsi esterni (divisione)

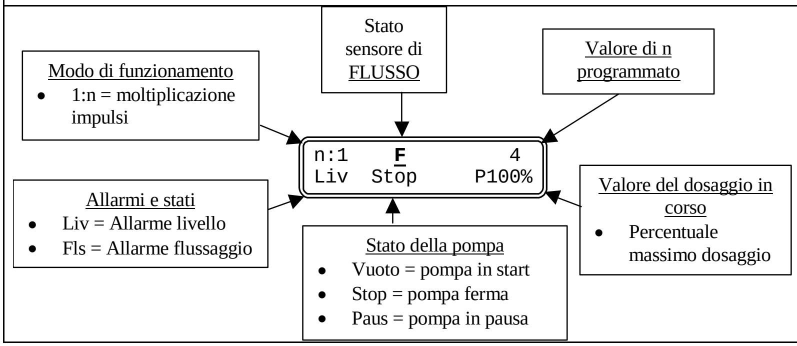
Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Dividi (n:1) <-
enter
Dividi (n:1)
n 4
enter
enter

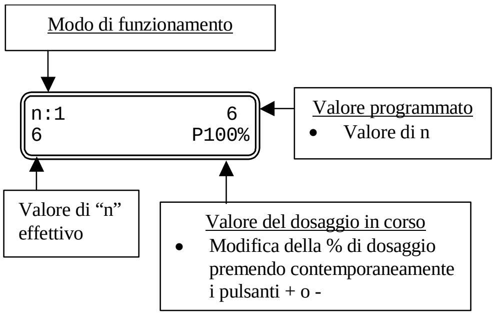
Funzionamento

La pompa dosa proporzionalmente ad un segnale esterno (es.: contatore lanciaimpulsi). Ad ogni “n” segnali ricevuti la pompa effettua un colpo. In programmazione imposto il valore di “n”. Programmando il valore di “n” si imposta la % di dosaggio massima, durante la fase di funzionamento posso modificare questo valore premendo contemporaneamente i tasti mode enter ⊕ per aumentarlo, oppure i pulsanti mode enter ⊖ per diminuirlo.

Visualizzazione durante il funzionamento

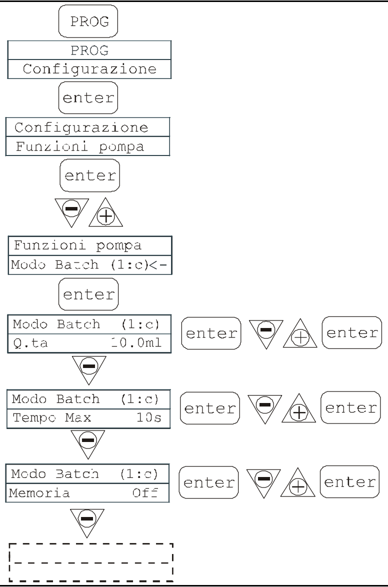

Stato sensore di FLUSSO
Valore di n programmato
Modo di funzionamento
• 1:n = moltiplicazione impulsi
n:1 F 4
Liv Stop P100%
Allarmi e stati
• Liv = Allarme livello
• Fls = Allarme flussaggio
Valore del dosaggio in corso
• Percentuale massimo dosaggio
Stato della pompa
• Vuoto = pompa in start
• Stop = pompa ferma
• Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


Modo di funzionamento
n:1 6
6 P100%
Valore programmato
• Valore di n
Valore di “n” effettivo
Valore del dosaggio in corso
• Modifica della % di dosaggio premendo contemporaneamente i pulsanti + o -

Paragrafo 6 – Proporzionale ad impulsi esterni (dosaggio batch)

Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Modo Batch (1:c)<-
enter
Modo Batch (1:c)
Q.ta 10.0ml
enter
enter
Modo Batch (1:c)
Tempo Max 10s
enter
enter
Modo Batch (1:c)
Memoria Off
enter
enter

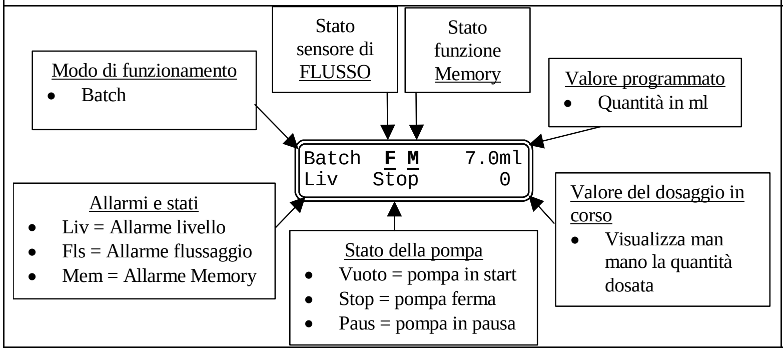
Funzionamento

La pompa dosa proporzionalmente ad un segnale esterno (es.: contatore lanciaimpulsi). In questo caso posso programmare la quantità da dosare in ml ed il tempo entro il quale completare il dosaggio.

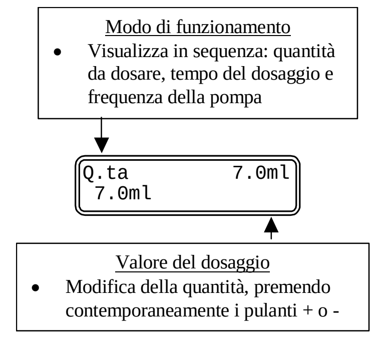
È possibile avviare il dosaggio manualmente tramite la pressione del pulsante ⊕, oppure tramite un comando remoto. Il pulsante start stop, interrompe il dosaggio, che può essere azzerato premendo il tasto ⊕, oppure riavviato premendo nuovamente start stop.

La quantità da dosare è modificabile durante la fase di funzionamento premendo contemporaneamente i tasti mode enter ⊕ per aumentare la portata, oppure i pulsanti mode enter ⊖ per diminuirla.

Visualizzazione durante il funzionamento

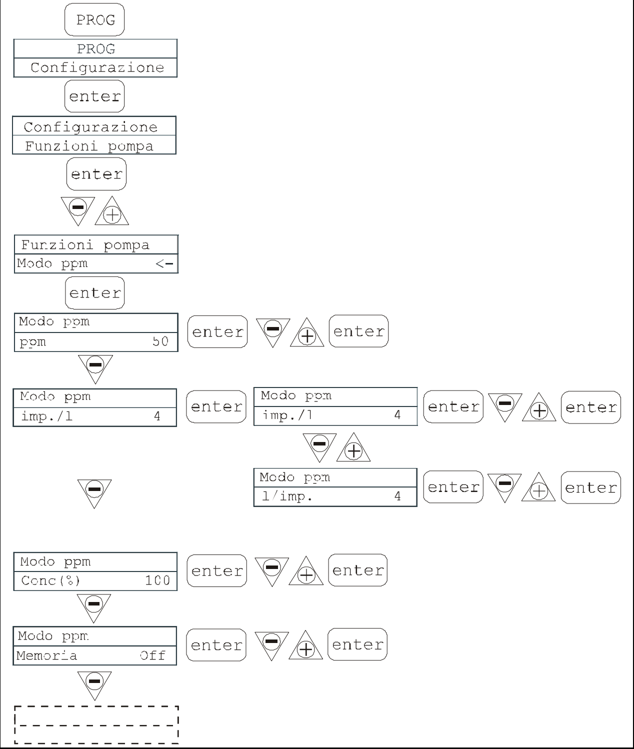

Stato sensore di FLUSSO
Stato funzione Memory
Modo di funzionamento
• Batch
Valore programmato
• Quantità in ml
Batch F M 7.0ml
Liv Stop 0
Allarmi e stati
• Liv = Allarme livello
• Fls = Allarme flussaggio
• Mem = Allarme Memory
Valore del dosaggio in corso
• Visualizza man mano la quantità dosata
Stato della pompa
• Vuoto = pompa in start
• Stop = pompa ferma
• Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


Modo di funzionamento
• Visualizza in sequenza: quantità da dosare, tempo del dosaggio e frequenza della pompa
Q.ta 7.0ml
7.0ml
Valore del dosaggio
• Modifica della quantità, premendo contemporaneamente i pulanti + o -

Paragrafo 7 – Proporzionale ad impulsi esterni (dosaggio in ppm)

Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Modo ppm <-
enter
Modo ppm
ppm 50
enter
enter
Modo ppm
imp./l 4
enter
Modo ppm
imp./l 4
enter
enter
Modo ppm
l/imp. 4
enter
enter
Modo ppm
Conc(%) 100
enter
enter
Modo ppm
Memoria Off
enter
enter

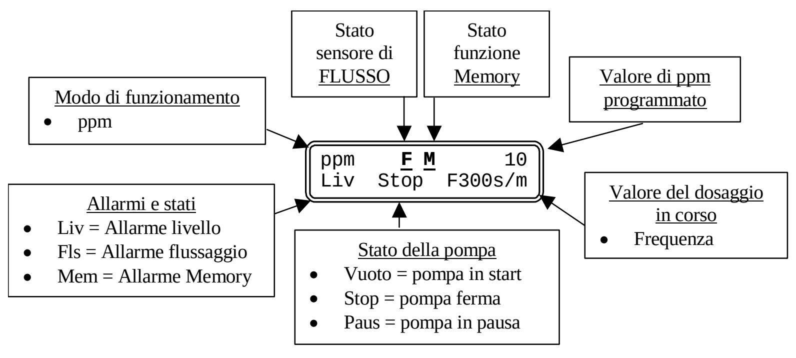
Funzionamento

La pompa dosa proporzionalmente ad un segnale esterno (es.: contatore lanciaimpulsi) calcolando automaticamente il rapporto tra segnali in ingresso e colpi della pompa in funzione del valore di ppm programmato.

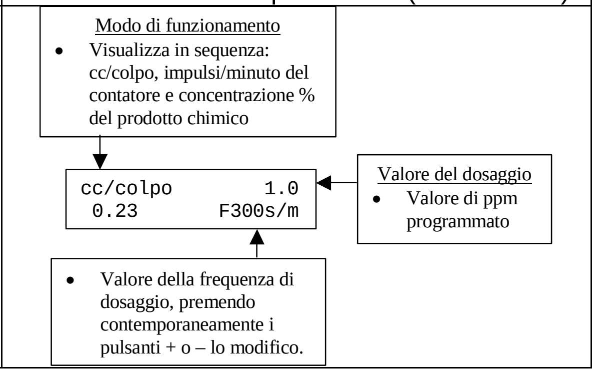
I dati da inserire sono il valore di ppm, il rapporto impulsi/litro (oppure litri/impulso) del contatore e la concentrazione del prodotto da dosare.

Durante la fase di funzionamento posso modificare la frequenza di dosaggio, premendo contemporaneamente i tasti mode enter ⊕ per aumentarla, oppure i pulsanti mode enter ⊖ per diminuirla.

Visualizzazione durante il funzionamento

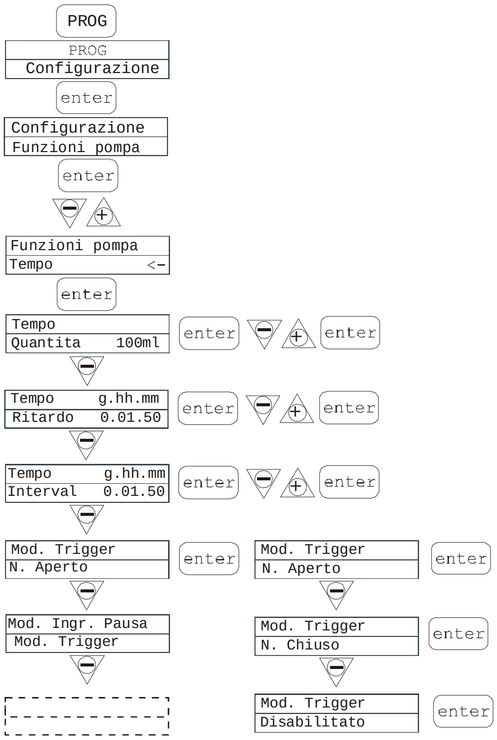

Stato sensore di FLUSSO
Stato funzione Memory
Modo di funzionamento
• ppm
Valore di ppm programmato
ppm F M 10
Liv Stop F300s/m
Allarmi e stati
• Liv = Allarme livello
• Fls = Allarme flussaggio
• Mem = Allarme Memory
Valore del dosaggio in corso
• Frequenza
Stato della pompa
• Vuoto = pompa in start
• Stop = pompa ferma
• Paus = pompa in pausa

Visualizzazione in impostazione (tasto MODE)


Modo di funzionamento
• Visualizza in sequenza: cc/colpo, impulsi/minuto del contatore e concentrazione % del prodotto chimico
cc/colpo 1.0
0.23 F300s/m
Valore del dosaggio
• Valore di ppm programmato
• Valore della frequenza di dosaggio, premendo contemporaneamente i pulsanti + o – lo modifico.

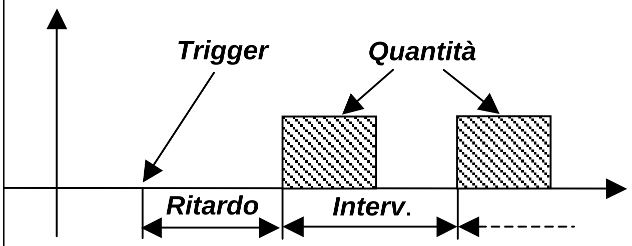
Paragrafo 8 – Dosaggio temporizzato (*Ingresso segnale frequenza* “*TRIGGER” attivato)*

Programmazione

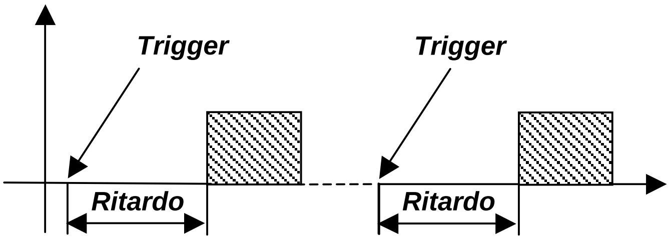

PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Tempo <-
enter
Tempo
Quantita 100ml
enter
enter
Tempo g.hh.mm
Ritardo 0.01.50
enter
enter
Tempo g.hh.mm
Interval 0.01.50
enter
enter
Mod. Trigger
N. Aperto
enter
Mod. Trigger
N. Aperto
enter
Mod. Ingr. Pausa
Mod. Trigger
Mod. Trigger
N. Chiuso
enter
Mod. Trigger
Disabilitato
enter

Funzionamento

Dopo la ricezione del segnale di ***Trigger*** impostato, la pompa dosa una quantità programmabile in ml. È possibile impostare un tempo di ritardo prima del dosaggio (***Ritardo***) e la distanza tra dosaggi successivi (***Interv***al.) come illustrato nello schema:

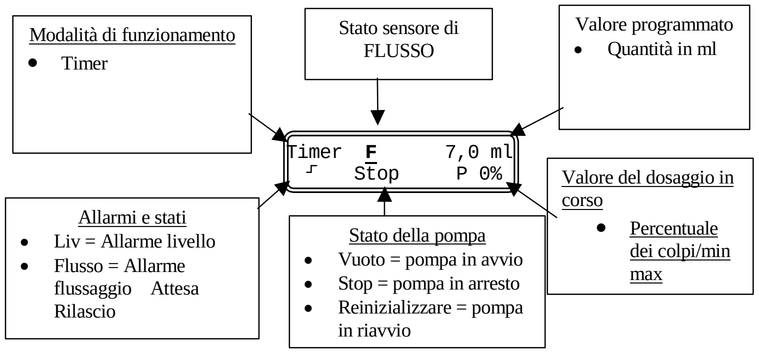
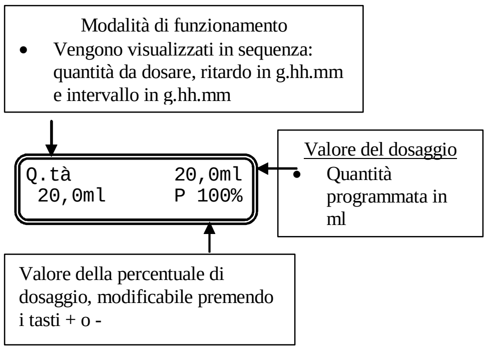

Trigger
Quantità
Ritardo
Interv.

Impostando, ad esempio, un tempo ***Interv***.= 0 si ottiene un sistema nel quale la quantità programmata viene dosata dopo ogni segnale di ***TRIGGER*** (con l’eventuale ritardo impostato):


Trigger
Trigger
Ritardo
Ritardo

È possibile avviare il dosaggio anche premendo il tasto +, il quale praticamente simula il segnale di ***Trigger***.
Il segnale ***Trigger*** può essere impostato su ***N. Aperto*** (si attiva quando l’ingresso passa dalla modalità aperta a quella chiusa) o su ***N. Chiuso*** (si attiva quando l’ingresso passa dalla modalità chiusa a quella aperta).
Il segnale ***Trigger*** è bloccato durante il dosaggio (la sua ricezione non viene né memorizzata né gestita).
L’ingresso ***Pausa*** (***Ingresso telecomando***) non può essere programmato e la sua attivazione blocca il dosaggio, mentre la successiva disattivazione rimette il sistema in attesa del segnale ***Trigger*** per un nuovo dosaggio.

Durante la fase di funzionamento della pompa, è possibile modificare la frequenza di dosaggio premendo contemporaneamente i tasti mode enter ⊕ per aumentare la frequenza oppure i tasti mode enter ⊖ per diminuirla.

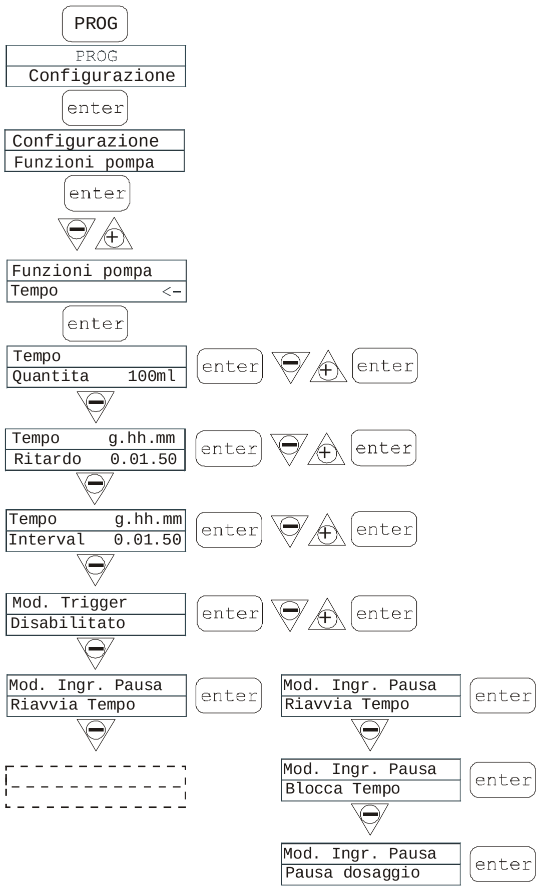
Visualizzazione durante il funzionamento	Visualizzazione all’avvio (tasto MODE)
	

Modalità di funzionamento
Timer
Stato sensore di FLUSSO
Valore programmato
Quantità in ml
Timer F 7,0 ml
Stop P 0%
Valore del dosaggio in corso
Percentuale dei colpi/min max
Allarmi e stati
Liv = Allarme livello
Flusso = Allarme flussaggio Attesa Rilascio
Stato della pompa
Vuoto = pompa in avvio
Stop = pompa in arresto
Reinizializzare = pompa in riavvio

Modalità di funzionamento
Vengono visualizzati in sequenza: quantità da dosare, ritardo in g.hh.mm e intervallo in g.hh.mm
Q.tà 20,0ml
20,0ml P 100%
Valore del dosaggio
Quantità programmata in ml
Valore della percentuale di dosaggio, modificabile premendo i tasti + o -

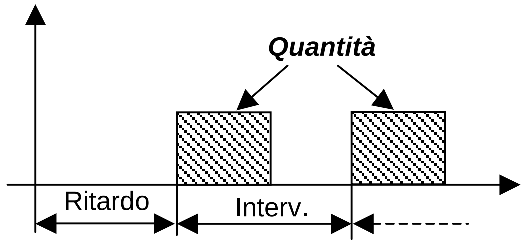
Paragrafo 8 – Dosaggio temporizzato (*Ingresso segnale frequenza* "*TRIGGER*" *non attivato*)

Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
enter
Funzioni pompa
Tempo <-
enter
Tempo
Quantita 100ml
enter
enter
Tempo g.hh.mm
Ritardo 0.01.50
enter
enter
Tempo g.hh.mm
Interval 0.01.50
enter
enter
Mod. Trigger
Disabilitato
enter
enter
Mod. Ingr. Pausa
Riavvia Tempo
enter
Mod. Ingr. Pausa
Riavvia Tempo
enter
Mod. Ingr. Pausa
Blocca Tempo
enter
Mod. Ingr. Pausa
Pausa dosaggio
enter

Funzionamento

La pompa dosa una quantità programmabile in ml, è possibile impostare un tempo di ritardo all'avvio della pompa (***Ritardo***) e la distanza tra due dosaggi successivi (***Interval.***) come illustrato nello schema:


Quantità
Ritardo
Interv.

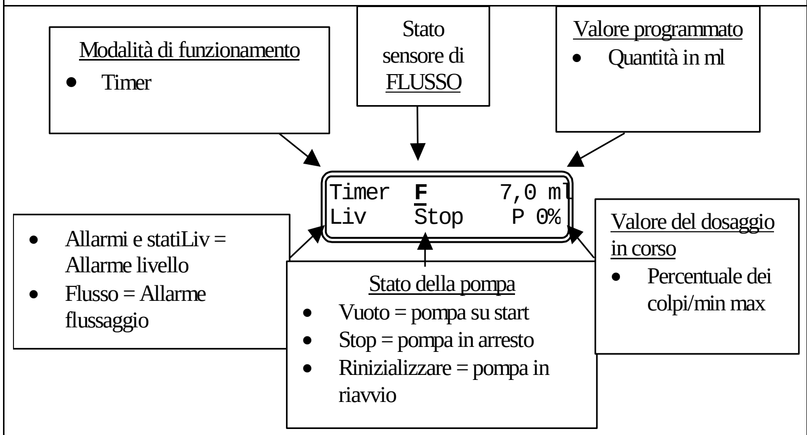
I tempi di ***Ritardo*** e di ***Interv***. sono in gg.hh.mm (giorni.ore.minuti)

L'ingresso della ***Pausa*** può essere programmato in tre modalità diverse:

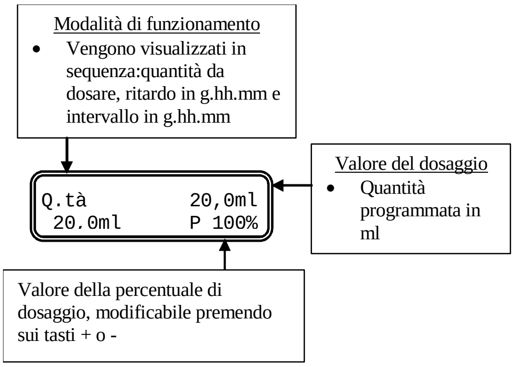
1. ***Blocca Tempo***: con la pausa attivata, il sistema blocca il conteggio del tempo attuale e lo riprende quando la pausa si disattiva
2. ***Pausa dosaggio***: con la pausa attivata, il sistema continua a contare il tempo e blocca il dosaggio
3. ***Riavvia Tempo***: con la pausa attivata, il sistema blocca il dosaggio e quando la pausa si disattiva il conteggio ricomincia dall'inizio.

Durante la fase di funzionamento della pompa, è possibile modificare la frequenza di dosaggio premendo contemporaneamente i tasti mode enter ⊕ per aumentare la frequenza oppure i tasti mode enter ⊖ per diminuirla.

Visualizzazione durante il funzionamento

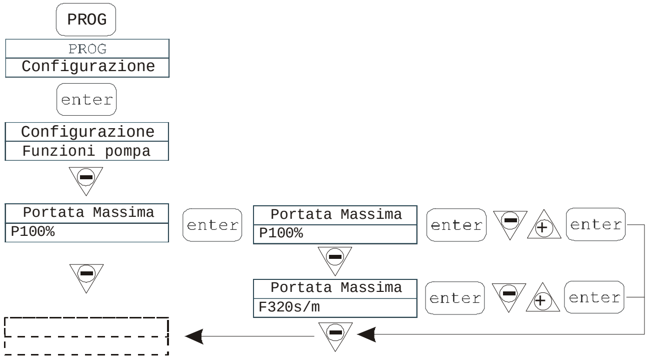

Modalità di funzionamento
Timer
Stato sensore di FLUSSO
Valore programmato
Quantità in ml
Timer F 7,0 ml
Liv Stop P 0%
Allarmi e statiLiv = Allarme livello
Flusso = Allarme flussaggio
Stato della pompa
Vuoto = pompa su start
Stop = pompa in arresto
Rinizializzare = pompa in riavvio
Valore del dosaggio in corso
Percentuale dei colpi/min max

Visualizzazione all'avvio (tasto MODE)


Modalità di funzionamento
Vengono visualizzati in sequenza:quantità da dosare, ritardo in g.hh.mm e intervallo in g.hh.mm
Q.tà 20,0ml
20.0ml P 100%
Valore del dosaggio
Quantità programmata in ml
Valore della percentuale di dosaggio, modificabile premendo sui tasti + o -

Paragrafo 9 – Impostazione massima portata

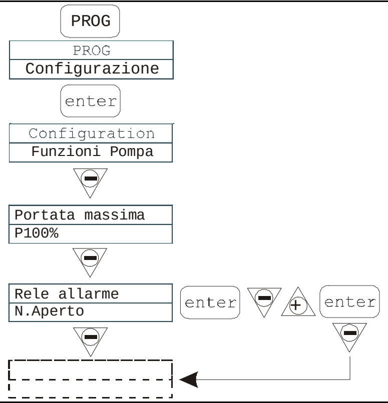
Programmazione


PROG
PROG
Configurazione
enter
Configurazione
Funzioni pompa
Portata Massima
P100%
enter
Portata Massima
P100%
enter
enter
Portata Massima
F320s/m
enter
enter

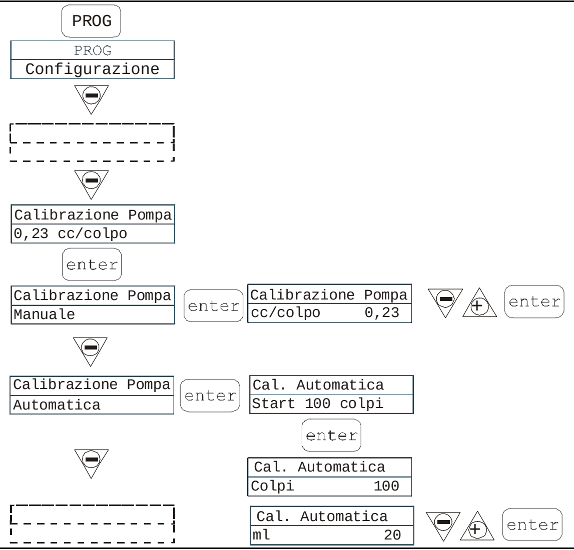
Funzionamento

Permette di impostare la massima portata raggiungibile dalla pompa e la modalità programmata (% o frequenza) diventa la visualizzazione della portata nell'unità di misura standard. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il valore. Con mode enter confermo e torno al menu principale

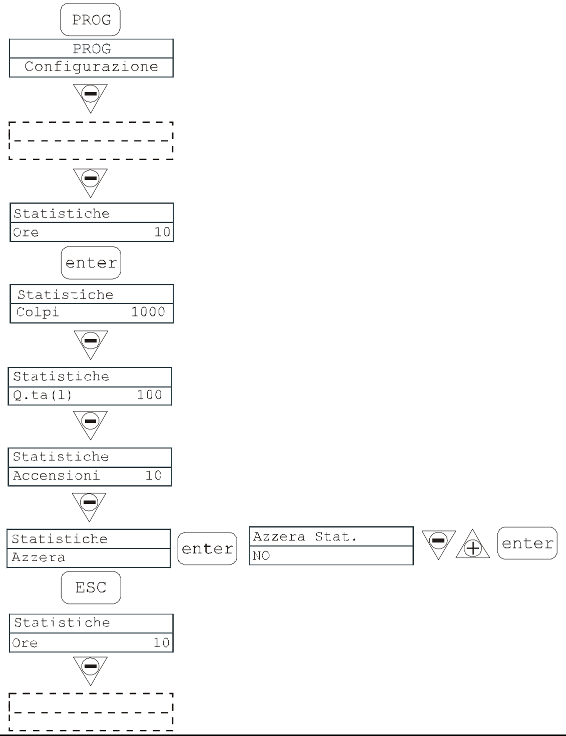
Paragrafo 10 – Impostazione relé d’allarme

Programmazione	Funzionamento
 PROG PROG Configurazione enter Configuration Funzioni Pompa Portata massima P100% Rele allarme N.Aperto enter enter	In assenza di situazione d’allarme può essere impostato aperto (fabbrica) oppure chiuso. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il valore. Con mode enter confermo e torno al menu principale

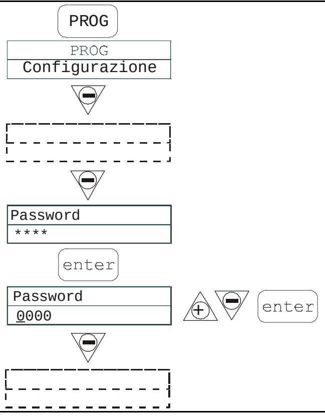
Paragrafo 11 – Calibrazione portata

Programmazione	Funzionamento
 PROG PROG Configurazione Calibrazione Pompa 0,23 cc/colpo enter Calibrazione Pompa Manuale enter Calibrazione Pompa cc/colpo 0,23 enter Calibrazione Pompa Automatica enter Cal. Automatica Start 100 colpi enter Cal. Automatica Colpi 100 Cal. Automatica ml 20 enter	Nel menu principale appare il valore di cc a colpo in memoria. È possibile calibrare in due modalità: MANUALE – inserisco manualmente il valore di cc a colpo con i tasti ⊕ ⊖ e confermo con mode enter AUTOMATICA – la pompa esegue 100 colpi, che vengono avviati con il tasto e confermo con mode enter, alla fine dei quali inserisco la quantità aspirata dalla pompa con i tasti ⊕ ⊖ e confermo con mode enter. Il dato inserito verrà utilizzato nei calcoli delle portate.

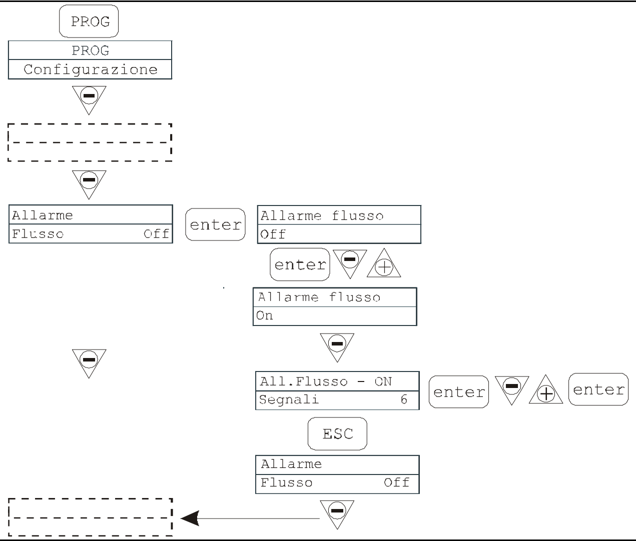
Paragrafo 12 – Statistiche

Programmazione	Funzionamento
 PROG PROG Configurazione Statistiche Ore 10 enter Statistiche Colpi 1000 Statistiche Q.ta(l) 100 Statistiche Accensioni 10 Statistiche Azzera enter Azzera Stat. NO enter ESC Statistiche Ore 10	Nel menu principale visualizza le ore di funzionamento della pompa, premendo il tasto mode enter accedo alle altre statistiche: - Strokes = numero di colpi eseguito dalla pompa - Q.ty(L) = quantità dosata dalla pompa espressa in litri; questo dato viene calcolato in base al valore cc/stroke in memoria - Power = numero di avviamenti della pompa - Reset = i tasti ⊕ ⊖ decido se azzerare i contatori (YES) oppure no (NO), con mode enter confermo. La pressione di ESC permette di tornare al menu principale.

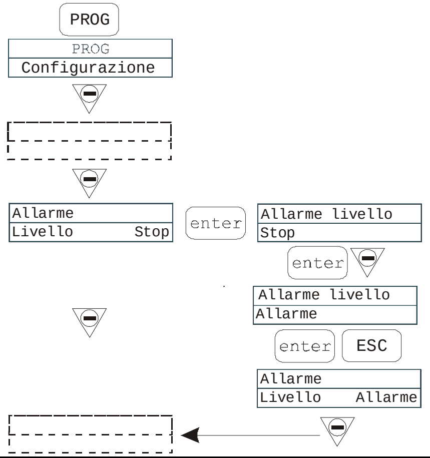
Paragrafo 13 – Password

Programmazione	Funzionamento
 PROG PROG Configurazione Password **** enter Password 0000 enter	Inserendo la password, potrò entrare in programmazione e vedere tutti i valori impostati, ma ogni volta che cercherò di modificarli verrà richiesta la password. La linea lampeggiante indica il numero modificabile, con il tasto ⊕ seleziono il numero (da 1 a 9), con il tasto ⊖ seleziono il numero da modificare, quindi con mode enter confermo. Impostando “0000” (fabbrica), la password viene esclusa.

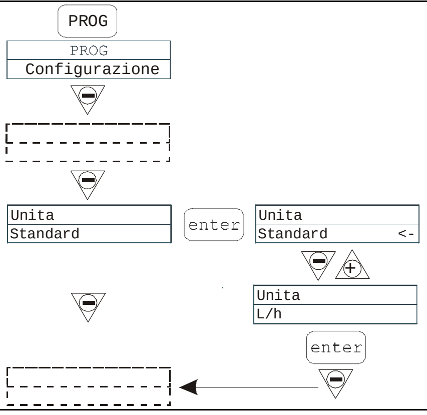
Paragrafo 14 – Allarme di flusso

Programmazione	Funzionamento
 PROG PROG Configurazione Allarme Flusso Off enter Allarme flusso Off enter Allarme flusso On All.Flusso - ON Segnali 6 enter enter ESC Allarme Flusso Off	Permette di attivare (disattivare) il sensore di flusso. Una volta attivato (On) premendoli tasto ⊖ si accede alla richiesta di quanti segnali aspetta la pompa prima di andare in allarme. Premendo mode enter lampeggia il numero, quindi con i tasti ⊕ ⊖ imposto il valore. Con mode enter confermo. Premendo ESC torno al menu principale

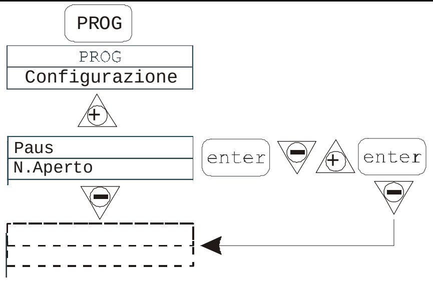
Paragrafo 15 – Allarme di livello

Programmazione	Funzionamento
 PROG PROG Configurazione Allarme Livello Stop enter Allarme livello Stop enter Allarme livello Allarme enter ESC Allarme Livello Allarme	Permette di impostare la pompa quando si attiva l’allarme del sensore di livello, cioè se bloccare il dosaggio (Stop), oppure se semplicemente attivare la segnalazione d’allarme senza bloccare il dosaggio. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il tipo di allarme. Con mode enter confermo. Premendo ESC torno al menu principale

Paragrafo 16 – Unità visualizzazione portata

Programmazione	Funzionamento
 PROG PROG Configurazione Unita Standard enter Unita Standard <- Unita L/h enter	Permette di impostare l'unità di misura del dosaggio a display in visualizzazione. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il tipo di unità di misura, L/h (Litri/ora), Gph (Galloni/ora), ml/m (millilitri/minuto) o standard (% o frequenza, a seconda di come impostato). Con mode enter confermo e torno al menu principale

Paragrafo 17 –Impostazione Pausa

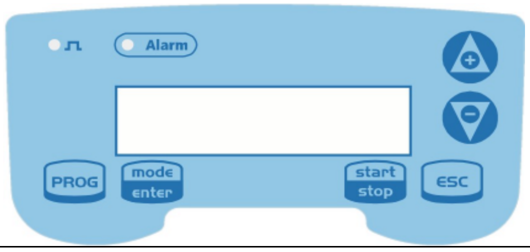
Programmazione	Funzionamento
 PROG PROG Configurazione Paus N.Aperto enter enter	Ingresso remoto per mettere in pausa la pompa. In fabbrica il sistema è impostato come Normalmente Aperto. Premendo mode enter si accede alla modifica, quindi con i tasti ⊕ ⊖ imposto il valore (N. APERTO oppure N. CHIUSO) Con mode enter confermo e torno al menu principale.

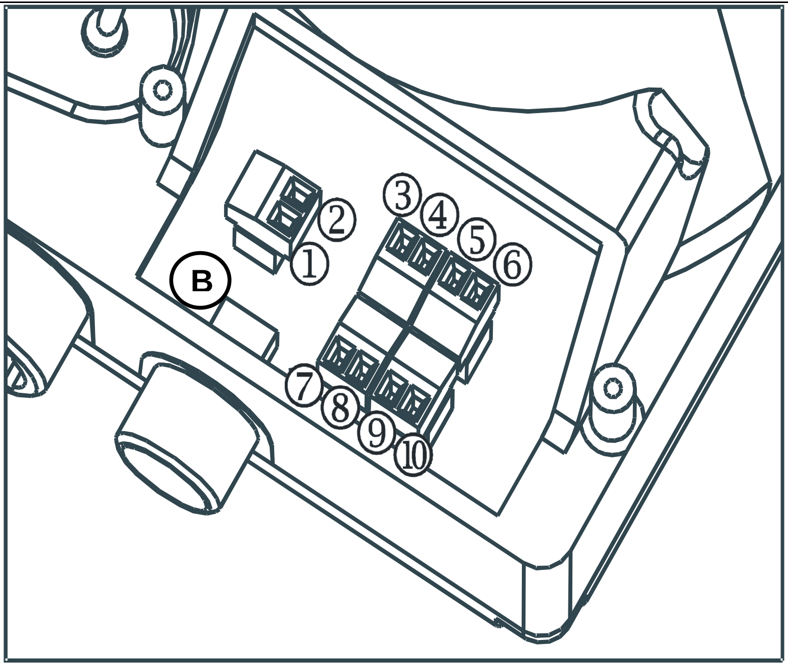
Regolazione contrasto display

Per la regolazione del contrasto del display tenere premuto il tasto ESC e entro 5 secondi premere i tasti ⊕ o ⊖ per incrementare o meno il contrasto.

Allarmi

Visualizzazione	**Causa**	**Interruzione**
Led Alarm fisso Scritta lev lampeggiante Es: Man Lev P100%	Allarme fine di livello, senza interruzione del funzionamento della pompa	Ripristino del livello del liquido.
Led Alarm fisso Scritta lev e stop lampeggiante Es: Man Lev Stop P100%	Allarme fine di livello, con interruzione del funzionamento della pompa	Ripristino del livello del liquido
Scritta Mem lampeggiante Es: 1:n 6 Mem	La pompa riceve uno o più impulsi durante il dosaggio con funzione memory in Off	Pressione del tasto start stop
Scritta Mem lampeggiante Es: 1:n **M** 6 Mem	La pompa riceve uno o più impulsi durante il dosaggio con funzione memory in On	Quando la pompa finisce di ricevere gli impulsi esterni restituisce i colpi memorizzati
Led Alarm fisso Scritta Flw lampeggiante Es: Man **F** Flw P100%	Allarme di flusso attivo, la pompa non ha ricevuto il numero di segnali programmati dal sensore di flusso.	Pressione del tasto start stop
Es: Parameter Error PROG to default	Errore di comunicazione interna della CPU.	Pressione del tasto PROG per ripristinare i parametri di default.

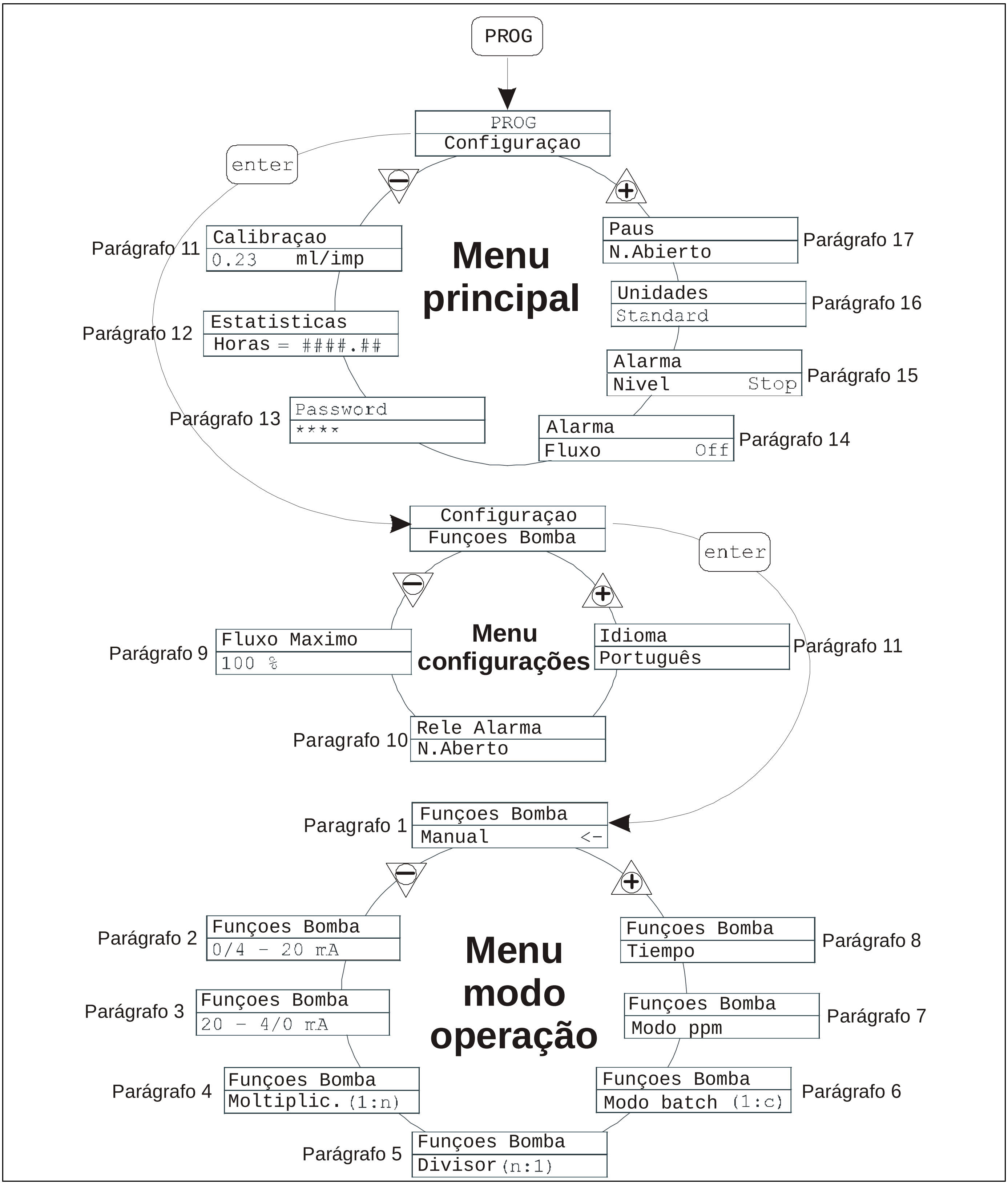
Painel de Controle - TEKNA TPG	
	
PROG	Acesso ao menu de programação
mode enter	Durante a fase de funcionamento da bomba: acionado visualiza ciclicamente no display os valores programados; Acionando simultaneamente às teclas ⊕ ⊖ aumenta ou reduz um valor dependente da modalidade de funcionamento pré-escolhida. Na programação desenvolve a função “enter”, isto é, confirma a entrada nos vários níveis de menu e as modificações no interior dos mesmos.
start stop	Liga ou desliga a bomba. Nas condições de alarme de nível (só função alarme), de fluxo e memory ativas, desativa a sinalazação no display.
ESC	Para “sair” dos vários níveis de menu. Antes de sair definitivamente da programação se acessa a requisição de salvar modificações.
⊕	Percorre os menus para cima, ou ainda, aumenta os valores numéricos a modificar. Na modalidade Batch pode iniciar a dosagem.
⊖	Percorre os menús para baixo, ou ainda, reduz os valores numéricos a modificar.
⎍	Led verde lampejante durante a dosagem.
Alarm	Led vermelho que ascende nas varias situações de alarme.

Conexões Elétricas			
	1	Relê de alarme	
	2		
	3	Polo +	Entrada 4-20 mA Impedância de entrada: 200 ohm
	4	Polo –	
	5	-Entrada do controle remoto (start-stop) -Entradas Pausa sinal	
	6		
	7	-Entradas de sinal em frequência (contador lança-impulsos) -Entradas Trigger sinal	
	8		
	9	Entradas do sensor de fluxo	
	10		
	B	Entrada da sonda de controle de nível	

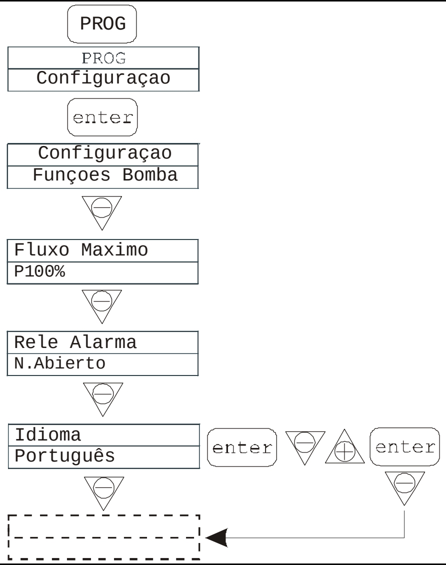
Menu de Programação Tekna TPG

Acionando a tecla PROG por mais de três segundos se acessa a programação. Com as teclas ⊕ ⊖ é possível percorrer os itens do menu, com a tecla mode enter se acessam as modificações.
De fábrica a bomba vem programada na modalidade constante. A bomba volta automaticamente na modalidade de funcionamento depois de 1 minuto de inatividade. Neste caso dados eventualmente inseridos não serão salvos.
Com a tecla ESC se sai dos níveis da programação. Na saida da programação o display mostra:

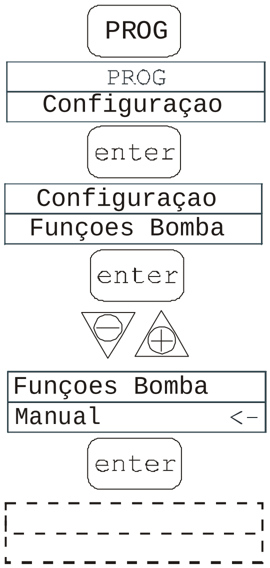
Saída		Saída	
Não Salva	∇ ∆	Salva	mode enter para confirmar a escolha

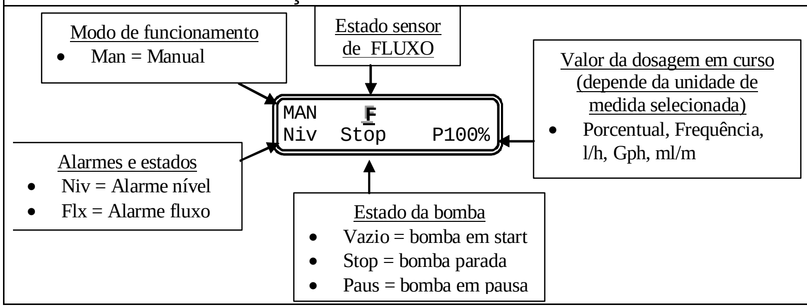
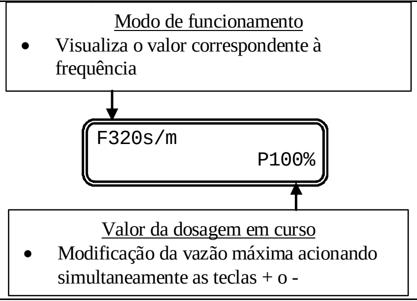

PROG
PROG
Configuraçao
enter
Menu principal
Parágrafo 11
Calibraçao
0.23 ml/imp
Parágrafo 12
Estatisticas
Horas = ####.##
Parágrafo 13
Password
****
Paus
N.Abierto
Parágrafo 17
Unidades
Standard
Parágrafo 16
Alarma
Nivel Stop
Parágrafo 15
Alarma
Fluxo Off
Parágrafo 14
Configuraçao
Funçoes Bomba
enter
Menu configurações
Parágrafo 9
Fluxo Maximo
100 %
Idioma
Português
Parágrafo 11
Paragrafo 10
Rele Alarma
N.Aberto
Paragrafo 1
Funçoes Bomba
Manual <-
Menu modo operação
Parágrafo 2
Funçoes Bomba
0/4 - 20 mA
Parágrafo 3
Funçoes Bomba
20 - 4/0 mA
Parágrafo 4
Funçoes Bomba
Moltiplic. (1:n)
Parágrafo 5
Funçoes Bomba
Divisor (n:1)
Funçoes Bomba
Tiempo
Parágrafo 8
Funçoes Bomba
Modo ppm
Parágrafo 7
Funçoes Bomba
Modo batch (1:c)
Parágrafo 6

Seleção do Idioma

Programação	Funcionamento
 PROG PROG Configuraçao enter Configuraçao Funçoes Bomba Fluxo Maximo P100% Rele Alarma N.Abierto Idioma Português enter enter	Permite selecionar o idioma, de fábrica a bomba vem programada em inglês. Acionando mode enter se acessa a modificação, a seguir, com as teclas ⊕ ⊖ seleciono o valor. Com mode enter confirmo e volto ao menu principal

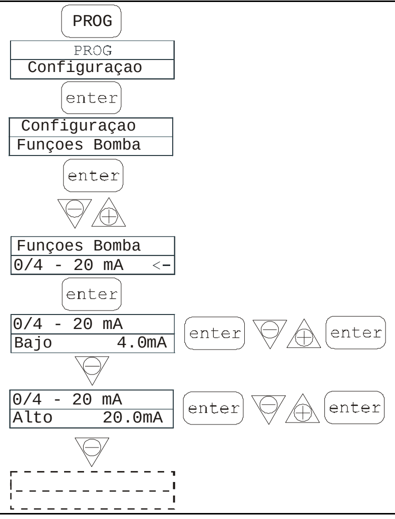
Parágrafo 1 - Dosagem Manual

Programação	Funcionamento
 PROG PROG Configuraçao enter Configuraçao Funçoes Bomba enter Funçoes Bomba Manual <- enter	A bomba trabalha na modalidade constante. A vazão é controlada e manualmente acionando simultaneamente as teclas mode enter ⊕ para aumentar o valor da vazão, ou ainda as teclas mode enter ⊖ para diminuí-lo.

Visualização durante o funcionamento	Visualização em selação (tecla MODE)
 MAN F Niv Stop P100% Modo de funcionamento - Man = Manual Estado sensor de FLUXO Valor da dosagem em curso (depende da unidade de medida selecionada) - Porcentual, Frequência, l/h, Gph, ml/m Alarmes e estados - Niv = Alarme nível - Flx = Alarme fluxo Estado da bomba - Vazio = bomba em start - Stop = bomba parada - Paus = bomba em pausa	 F320s/m P100% Modo de funcionamento - Visualiza o valor correspondente à frequência Valor da dosagem em curso - Modificação da vazão máxima acionando simultaneamente as teclas + o -

Parágrafo 2 - Dosagem Proporcional a Sinal 0/4-20 mA

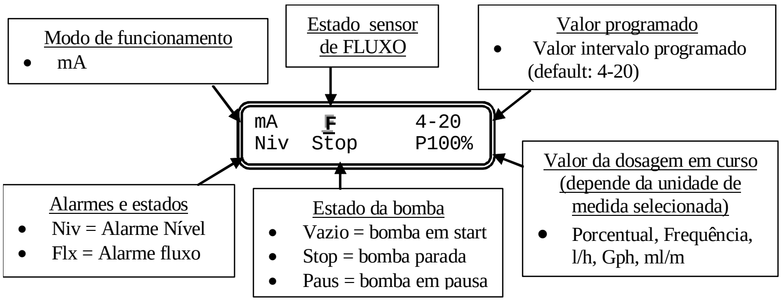
Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
0/4 - 20 mA <-
enter
0/4 - 20 mA
Bajo 4.0mA
enter
enter
0/4 - 20 mA
Alto 20.0mA
enter
enter

Funcionamento

A bomba dosa proporcionalmente a um sinal (0)4-20 mA. De fábrica a bomba interrompe a dosagem a 4 mA e dosa na máxima frequência selecionada quando recebe 20 mA. Em programação é possível modificar estes due valores. A freqüência máxima é modificável durante o funcionamento, acionando simultaneamente as teclas mode enter ⊕ para aumentar a vazão, ou ainda, as teclas mode enter ⊖ para diminuí-la.

Visualização durante o funcionamento


mA F 4-20
Niv Stop P100%

Modo de funcionamento
- mA

Estado sensor de FLUXO

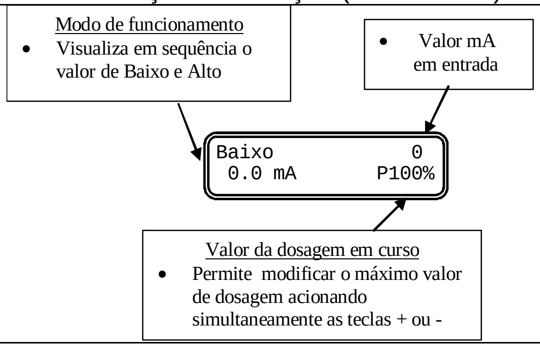
Valor programado
- Valor intervalo programado (default: 4-20)

Valor da dosagem em curso (depende da unidade de medida selecionada)
- Porcentual, Frequência, l/h, Gph, ml/m

Alarmes e estados
- Niv = Alarme Nível
- Flx = Alarme fluxo

Estado da bomba
- Vazio = bomba em start
- Stop = bomba parada
- Paus = bomba em pausa

Visualização em seleção (tecla MODE)


Baixo 0
0.0 mA P100%

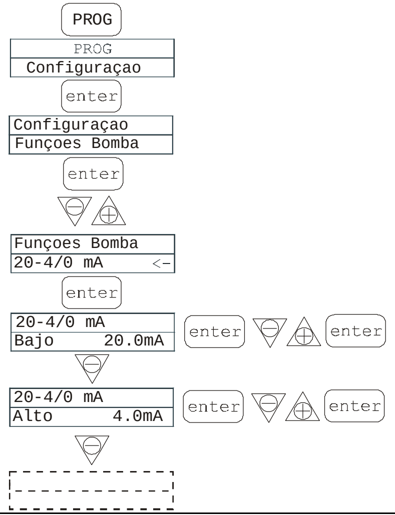
Modo de funcionamento
- Visualiza em sequência o valor de Baixo e Alto

- Valor mA em entrada

Valor da dosagem em curso
- Permite modificar o máximo valor de dosagem acionando simultaneamente as teclas + ou -

Parágrafo 3 - Dosagem Proporcional a Sinal 20-4/0 mA

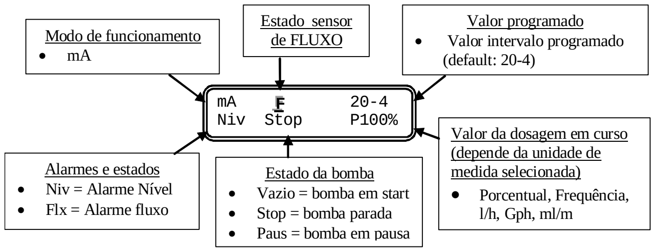
Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
20-4/0 mA <-
enter
20-4/0 mA
Bajo 20.0mA
enter
enter
20-4/0 mA
Alto 4.0mA
enter
enter

Funcionamento

A bomba dosa proporcionalmente a um sinal 20-4(0) mA. De fabrica bomba interrompe a dosagem a 20 mA e dosa na máxima frequência selecionada quando recebe 4 mA. Em programação é possível modificar estes dois valores. A freqüência máxima é modificável durante a fase de funcionamento acionando simultaneamente as teclas mode enter ⊕ para aumentar a vazão, ou ainda, as teclas mode enter ⊖ para diminuí-la.

Visualização durante o funcionamento


mA F 20-4
Niv Stop P100%

Modo de funcionamento
- mA

Estado sensor de FLUXO

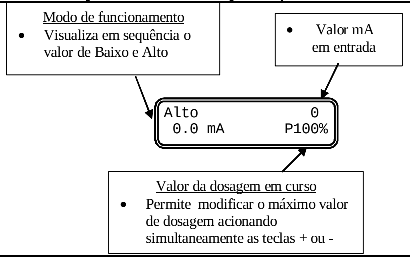
Valor programado
- Valor intervalo programado (default: 20-4)

Valor da dosagem em curso (depende da unidade de medida selecionada)
- Porcentual, Frequência, l/h, Gph, ml/m

Alarmes e estados
- Niv = Alarme Nível
- Flx = Alarme fluxo

Estado da bomba
- Vazio = bomba em start
- Stop = bomba parada
- Paus = bomba em pausa

Visualização em seleção (tecla MODE)


Alto 0
0.0 mA P100%

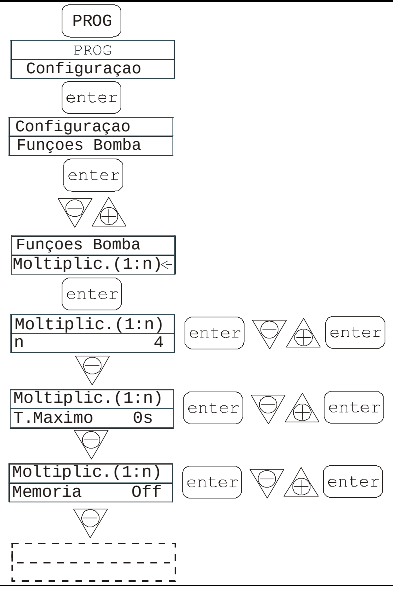
Modo de funcionamento
- Visualiza em sequência o valor de Baixo e Alto

- Valor mA em entrada

Valor da dosagem em curso
- Permite modificar o máximo valor de dosagem acionando simultaneamente as teclas + ou -

Parágrafo 4 - Proporcional a impulsos externos (multiplicação)

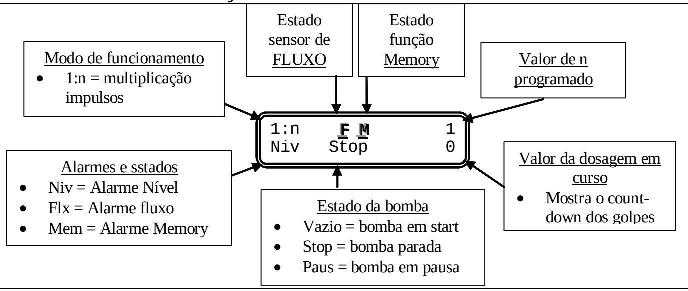
Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Moltiplic.(1:n)<
enter
Moltiplic.(1:n)
n 4
enter
enter
Moltiplic.(1:n)
T.Maximo 0s
enter
enter
Moltiplic.(1:n)
Memoria Off
enter
enter

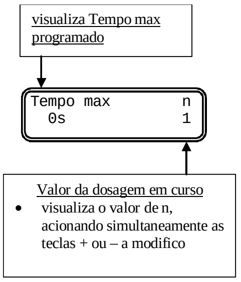
Funcionamento

A bomba dosa proporcionalmente a um sinal externo (ex.: contador lança-impulsos). A cada sinal recebido a bomba efetua os “n” golpes programados. A bomba seleciona automaticamente a frequência de dosagem, adaptando-a ao tempo que intercorre entre dois sinais sucessivos. É possível programar em segundos o tempo (time/out) além do qual a bomba zera a contagem do intervalo, para evitar dosagens em tempos muito longos. A bomba dispõe da função memory, que assinala o recebimento de um sinal durante a dosagem. Se selecionada em Off se limita a assinalar, se em On assinala e memoriza os impulsos, a seguir os executa quando para de receber sinais.
O valor de “n” é modificável durante a fase de funcionamento acionando simultaneamente as teclas mode enter ⊕ para aumentar o valor da vazão, ou ainda, as teclas mode enter ⊖ para reduzi-lo.

Visualização durante o funcionamento

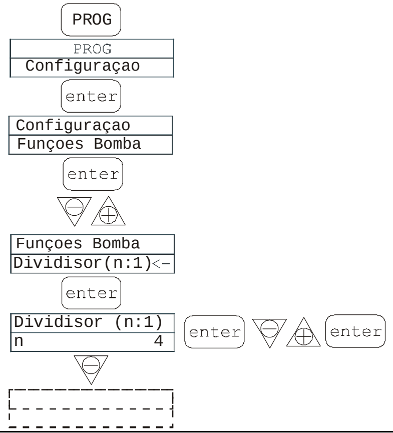

Estado sensor de FLUXO
Estado função Memory
Modo de funcionamento
• 1:n = multiplicação impulsos
Valor de n programado
1:n F M 1
Niv Stop 0
Alarmes e stados
• Niv = Alarme Nível
• Flx = Alarme fluxo
• Mem = Alarme Memory
Valor da dosagem em curso
• Mostra o count-down dos golpes
Estado da bomba
• Vazio = bomba em start
• Stop = bomba parada
• Paus = bomba em pausa

Visualização em seleção (tecla MODE)


visualiza Tempo max programado
Tempo max n
0s 1
Valor da dosagem em curso
• visualiza o valor de n, acionando simultaneamente as teclas + ou – a modifico

Parágrafo 5 - Proporcional a impulsos externos (divisão)

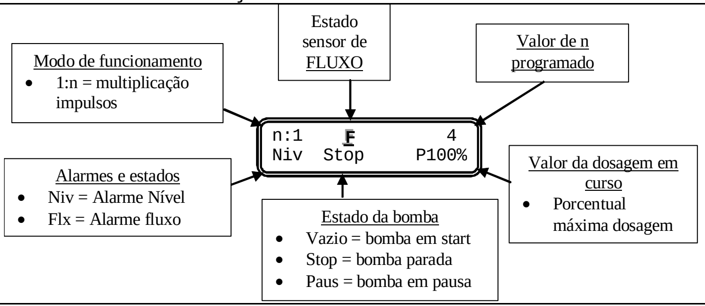
Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Dividisor(n:1)<–
enter
Dividisor (n:1)
n 4
enter
enter

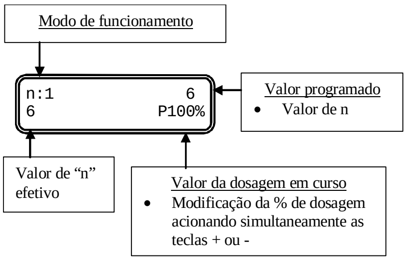
Funcionamento

A bomba dosa proporcionalmente a um sinal externo (ex.: contador lança-impulsos). A cada “n” sinais recebidos a bomba efetua um golpe. Em programação seleciono o valor de “n”. Programando o valor de “n” se seleciona a % de dosagem máxima, durante a fase de funcionamento posso modificar este valor acionando simultaneamente as teclas mode enter ⊕ para aumentá-lo, ou ainda as teclas mode enter ⊖ para diminuí-lo.

Visualização durante o funcionamento

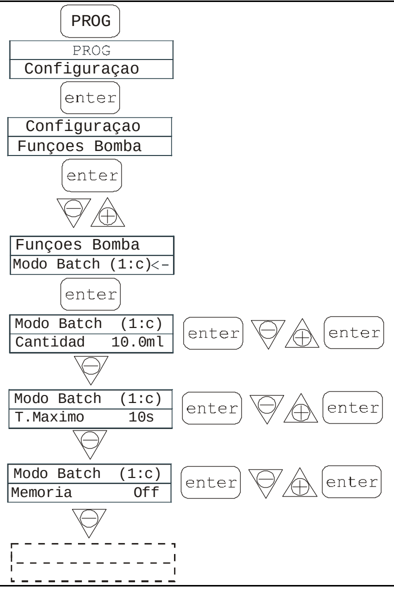

Estado sensor de FLUXO
Valor de n programado
Modo de funcionamento
• 1:n = multiplicação impulsos
n:1 F 4
Niv Stop P100%
Alarmes e estados
• Niv = Alarme Nível
• Flx = Alarme fluxo
Valor da dosagem em curso
• Porcentual máxima dosagem
Estado da bomba
• Vazio = bomba em start
• Stop = bomba parada
• Paus = bomba em pausa

Visualização em seleção (tecla MODE)


Modo de funcionamento
n:1 6
6 P100%
Valor programado
• Valor de n
Valor de “n” efetivo
Valor da dosagem em curso
• Modificação da % de dosagem acionando simultaneamente as teclas + ou -

Parágrafo 6 - Proporcional a impulsos externos (dosagem batch)

Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Modo Batch (1:c)<-
enter
Modo Batch (1:c)
Cantidad 10.0ml
enter
enter
Modo Batch (1:c)
T.Maximo 10s
enter
enter
Modo Batch (1:c)
Memoria Off
enter
enter

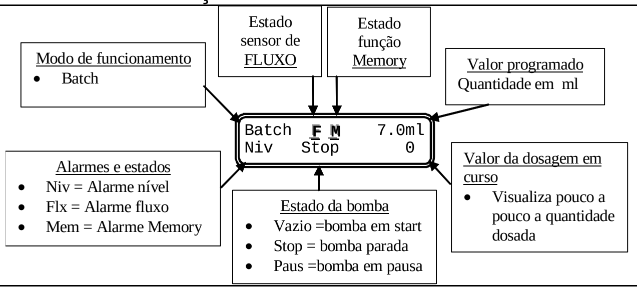
Funcionamento

A bomba dosa proporcionalmente a um sinal externo (ex.: contador lança-impulsos). Neste caso posso programar a quantidade a dosar em ml e o tempo no qual completar a dosagem.

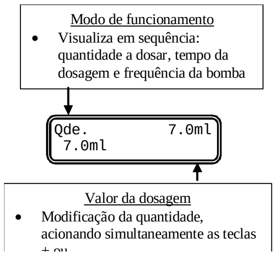
É possível fazer a dosagem manualmente através da pressão da tecla ⊕, ou ainda, através de um comando remoto. A tecla start stop, interrompe a dosagem, que pode ser zerada acionando a tecla ⊕, ou ainda, reiniciada acionando novamente start stop.

A quantidade a dosar é modificável durante a fase de funcionamento acionando simultaneamente as teclas mode enter ⊕ para aumentar a vazão, ou ainda, as teclas mode enter ⊖ para diminuí-la.

Visualização durante o funcionamento

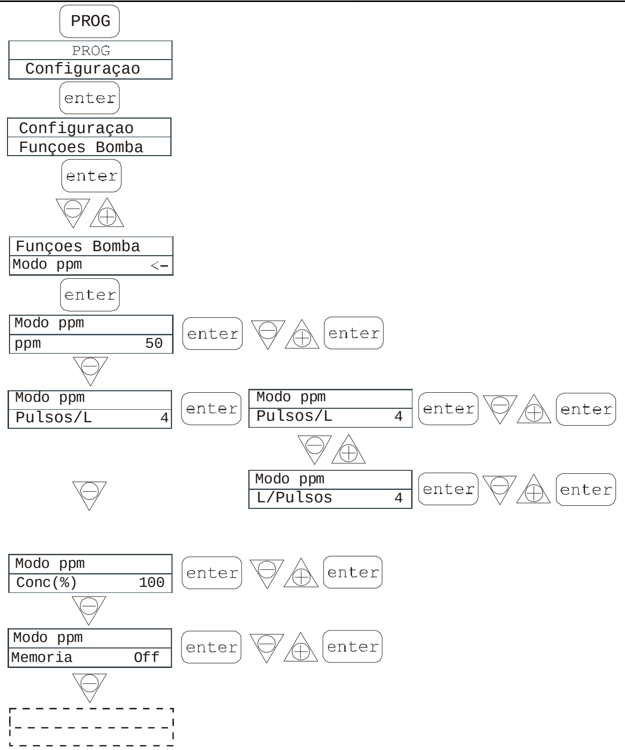

Modo de funcionamento
Batch
Estado sensor de FLUXO
Estado função Memory
Valor programado
Quantidade em ml
Batch F M 7.0ml
Niv Stop 0
Alarmes e estados
Niv = Alarme nível
Flx = Alarme fluxo
Mem = Alarme Memory
Estado da bomba
Vazio =bomba em start
Stop = bomba parada
Paus =bomba em pausa
Valor da dosagem em curso
Visualiza pouco a pouco a quantidade dosada

Visualização em seleção (tecla MODE)


Modo de funcionamento
Visualiza em sequência: quantidade a dosar, tempo da dosagem e frequência da bomba
Qde. 7.0ml
7.0ml
Valor da dosagem
Modificação da quantidade, acionando simultaneamente as teclas

Parágrafo 7 - Proporcional a impulsos externos (dosagem em PPM)

Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Modo ppm <-
enter
Modo ppm
ppm 50
enter
enter
Modo ppm
Pulsos/L 4
enter
Modo ppm
Pulsos/L 4
enter
enter
Modo ppm
L/Pulsos 4
enter
enter
Modo ppm
Conc(%) 100
enter
enter
Modo ppm
Memoria Off
enter
enter

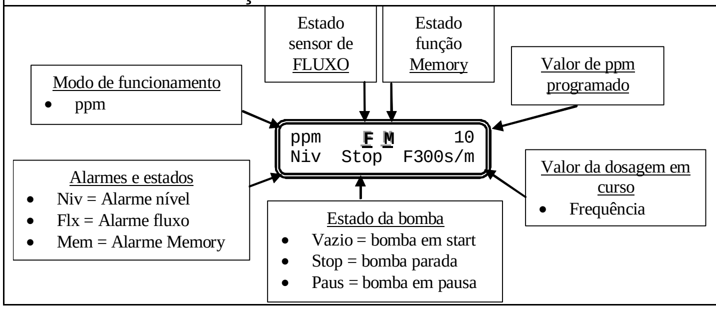
Funcionamento

A bomba dosa proporcionalmente a um sinal externo (ex.: contador lança-impulsos) calculando automaticamente a relação entre sinais em entrada e golpes da bomba em função do valor de ppm programado.

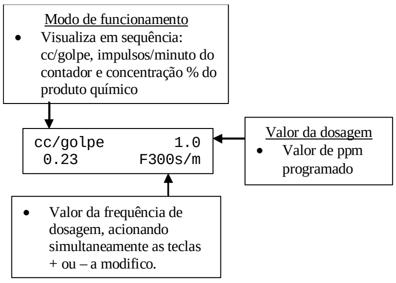
Os dados a inserir são o valor de ppm, a relação impulsos/litro (ou ainda litros/impulso) do contador e a concentração do produto a dosar.

Durante a fase de funcionamento posso modificar a freqüência de dosagem, acionando simultaneamente as teclas mode enter ⊕ para aumentá-la, ou ainda as teclas mode enter ⊖ para diminuí-la.

Visualização durante o funcionamento

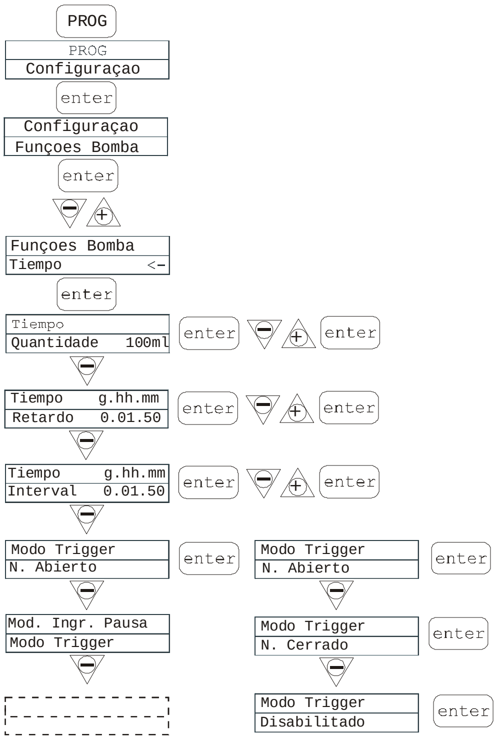

Estado sensor de FLUXO
Estado função Memory
Modo de funcionamento
• ppm
Valor de ppm programado
ppm F M 10
Niv Stop F300s/m
Alarmes e estados
• Niv = Alarme nível
• Flx = Alarme fluxo
• Mem = Alarme Memory
Valor da dosagem em curso
• Frequência
Estado da bomba
• Vazio = bomba em start
• Stop = bomba parada
• Paus = bomba em pausa

Visualização em seleção (tecla MODE)


Modo de funcionamento
• Visualiza em sequência: cc/golpe, impulsos/minuto do contador e concentração % do produto químico
cc/golpe 1.0
0.23 F300s/m
Valor da dosagem
• Valor de ppm programado
• Valor da frequência de dosagem, acionando simultaneamente as teclas + ou – a modifico.

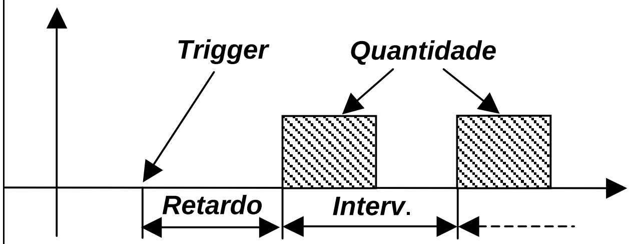
Parágrafo 8 – Dosagem temporizada **(Entrada do sinal de frequência "TRIGGER" activado)**

Programação

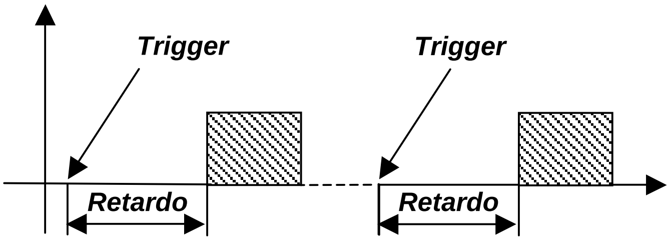

PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Tiempo <-
enter
Tiempo
Quantidade 100ml
enter
enter
Tiempo g.hh.mm
Retardo 0.01.50
enter
enter
Tiempo g.hh.mm
Interval 0.01.50
enter
enter
Modo Trigger
N. Abierto
enter
Modo Trigger
N. Abierto
enter
Mod. Ingr. Pausa
Modo Trigger
Modo Trigger
N. Cerrado
enter
Modo Trigger
Disabilitado
enter

Funcionamento

Após a recepção do sinal de **TRIGGER** iniciado, a bomba doseia uma quantidade programável em ml. É possível estabelecer um tempo de atraso antes da dosagem (***Atraso***) e a distância entre as dosagens seguintes (***Interv***.) conforme ilustrado no esquema


Trigger
Quantidade
Retardo
Interv.

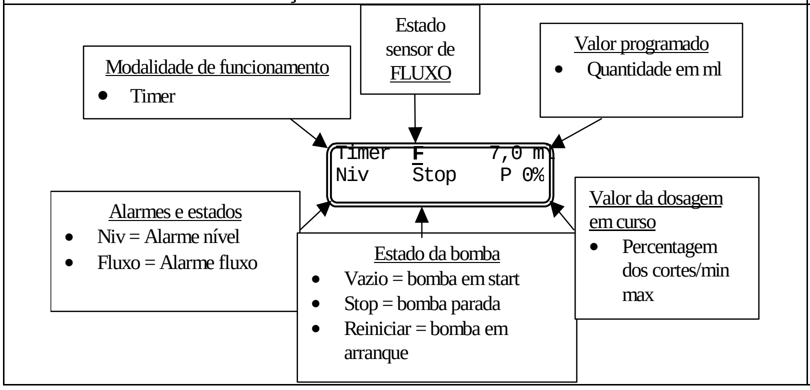
Ajustando, por exemplo, um tempo ***Interv***.= 0 obtém-se um sistema no qual a quantidade programada è doseada depois de cada sinal de **TRIGGER** (com o eventual atraso iniciado):


Trigger
Trigger
Retardo
Retardo

É possível iniciar a dosagem também premindo o botão +, o qual praticamente simula o sinal de **Trigger.**
O sinal **Trigger** pode ser iniciado em ***N.Abierto*** (activa-se quando a entrada passa da modalidade aberta para fechada) ou em ***N.Cerrado*** (activa-se quando a entrada passa da modalidade fechada para aberta).
O sinal **Trigger** fica bloqueado durante a dosagem (a sua recepção não se encontra memorizada nem gerida)
A entrada ***Pausa (Entrada telecomando)*** não pode ser programada e a sua activação bloqueia a dosagem, enquanto a desactivação seguinte remete o sistema em espera do sinal **Trigger** para uma nova dosagem.

Durante a fase de funcionamento da bomba, poderá alterar a frequência de dosagem, ao premir simultaneamente as teclas mode enter ⊕ para aumentar a frequência, ou também os botões mode enter ⊖ para a diminuir.

Visualização durante o funcionamento


Timer F 7,0 ml
Niv Stop P 0%

Modalidade de funcionamento
- Timer

Estado sensor de FLUXO

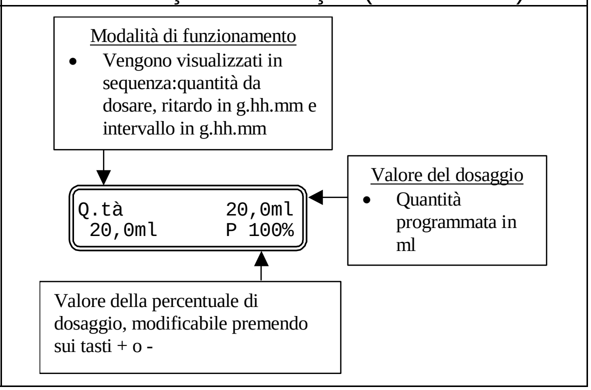
Valor programado
- Quantidade em ml

Alarmes e estados
- Niv = Alarme nível
- Fluxo = Alarme fluxo

Estado da bomba
- Vazio = bomba em start
- Stop = bomba parada
- Reiniciar = bomba em arranque

Valor da dosagem em curso
- Percentagem dos cortes/min max

Visualização em seleção (tecla MODE)


Q.tà 20,0ml
20,0ml P 100%

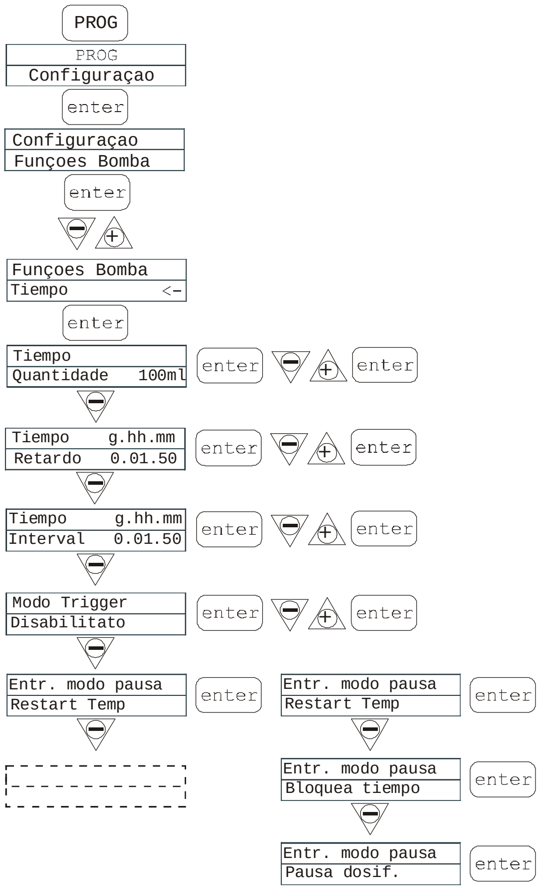
Modalità di funzionamento
- Vengono visualizzati in sequenza:quantità da dosare, ritardo in g.hh.mm e intervallo in g.hh.mm

Valore del dosaggio
- Quantità programmata in ml

Valore della percentuale di dosaggio, modificabile premendo sui tasti + o -

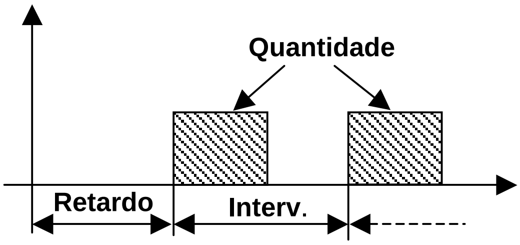
Parágrafo 8 – Dosagem temporizada **(Entrada do sinal de frequência “TRIGGER” não activado)**

Programação


PROG
PROG
Configuraçao
enter
Configuraçao
Funçoes Bomba
enter
Funçoes Bomba
Tiempo <-
enter
Tiempo
Quantidade 100ml
enter
enter
Tiempo g.hh.mm
Retardo 0.01.50
enter
enter
Tiempo g.hh.mm
Interval 0.01.50
enter
enter
Modo Trigger
Disabilitato
enter
enter
Entr. modo pausa
Restart Temp
enter
Entr. modo pausa
Restart Temp
enter
Entr. modo pausa
Bloquea tiempo
enter
Entr. modo pausa
Pausa dosif.
enter

Funcionamento

A bomba doseia uma quantidade programável em ml. Poderá ajustar um tempo de atraso no arranque da bomba (Atraso) e a distância entre duas intervenções seguidas (interv.), como indicado no esquema:


Quantidade
Retardo
Interv.

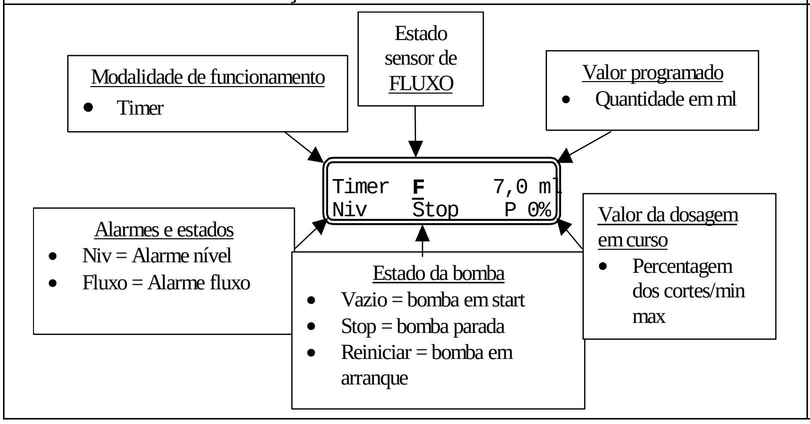
Os tempos de atraso e intervalo são exprimidos em dd.hh.mm (dias.horas.minutos)

A entrada da ***Pausa*** pode ser programada de três maneiras diferentes:

1. **Bloquea tiempo:** com a pausa activada, o sistema bloqueia a contagem do tempo actual e retoma-o quando a pausa é desactivada
2. **Pausa dosif.:** com a pausa activada, o sistema continua a contar o tempo e bloqueia a dosagem
3. **Restart Temp:** com a pausa activada o sistema bloqueia a dosagem e quando a pausa é desactivada a contagem recomeça desde o princípio.

Durante a fase de funcionamento da bomba, poderá alterar a frequência de dosagem, ao premir simultaneamente as teclas mode enter ⊕ para aumentar a frequência, ou também os botões mode enter ⊖ para a diminuir.

Visualização durante o funcionamento


Timer F 7,0 ml
Niv Stop P 0%

Modalidade de funcionamento
- Timer

Estado sensor de FLUXO

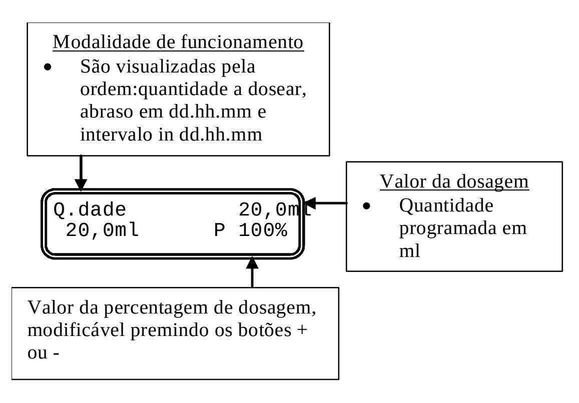
Valor programado
- Quantidade em ml

Alarmes e estados
- Niv = Alarme nível
- Fluxo = Alarme fluxo

Estado da bomba
- Vazio = bomba em start
- Stop = bomba parada
- Reiniciar = bomba em arranque

Valor da dosagem em curso
- Percentagem dos cortes/min max

Visualização em seleção (tecla MODE)

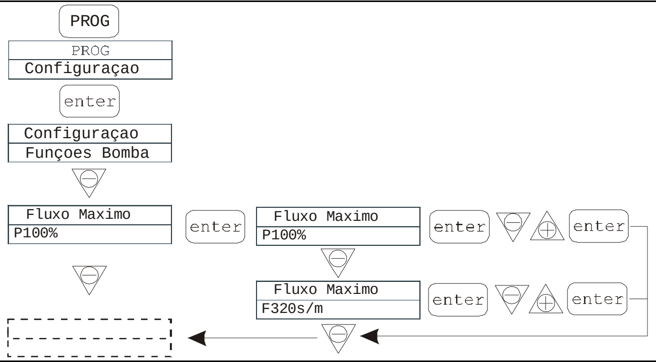

Q.dade 20,0ml
20,0ml P 100%

Modalidade de funcionamento
- São visualizadas pela ordem:quantidade a dosear, abraso em dd.hh.mm e intervalo in dd.hh.mm

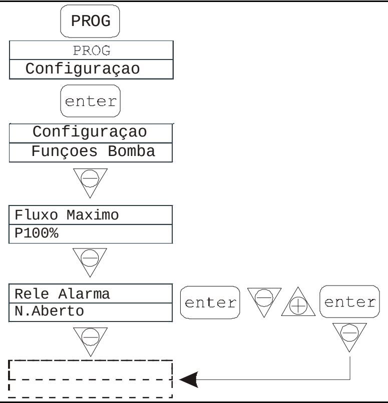
Valor da dosagem
- Quantidade programada em ml

Valor da percentagem de dosagem, modificável premindo os botões + ou -

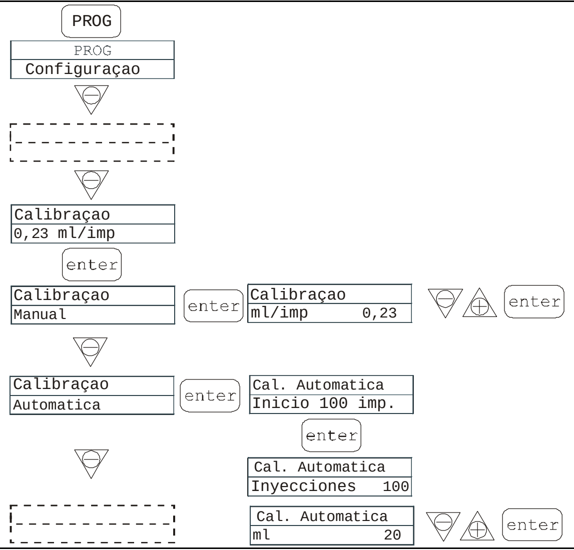
Parágrafo 9 - seleção máxima vasão

Programação	Funcionamento
 PROG PROG Configuraçao enter Configuraçao Funçoes Bomba Fluxo Maximo P100% enter Fluxo Maximo P100% enter enter Fluxo Maximo F320s/m enter enter	Permite selecionar a máxima vazão alcançável pela bomba e a modalidade programada (% ou freqüência) fica a visualização da vazão na unidade de medida Standard. Acionando mode enter se acessa a modificação, e a seguir com as teclas ⊕ ⊖ seleciono o valor. Com mode enter confirmo e volto ao menu principal

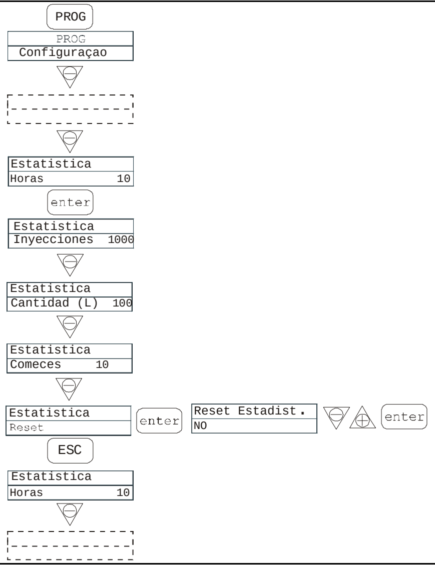
Parágrafo 10 - Seleção do Relê de Alarme

Programação	Funcionamento
 PROG PROG Configuraçao enter Configuraçao Funçoes Bomba Fluxo Maximo P100% Rele Alarma N.Aberto enter enter	Na ausência de situação de alarme pode ser selecionado aberto (de fábrica) ou ainda, fechado. Acionando mode enter se acessa a modificação, a seguir com as teclas ⊕ ⊖ seleciono o valor. Com mode enter confirmo e volto ao menu principal

Parágrafo 11 – Calibração da vasão

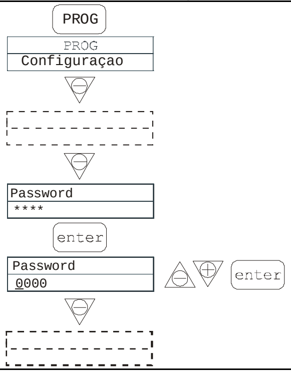
Programação	Funcionamento
 PROG PROG Configuraçao Calibraçao 0,23 ml/imp enter Calibraçao Manual enter Calibraçao ml/imp 0,23 enter Calibraçao Automatica enter Cal. Automatica Inicio 100 imp. enter Cal. Automatica Inyecciones 100 Cal. Automatica ml 20 enter	No menu principal aparece o valor de cc por golpe em memória. É possível calibrar em duas modalidades: MANUAL - insiro manualmente o valor de cc por golpe com as teclas ⊕ ⊖ e confirmo com mode enter AUTOMÁTICA - a bomba executa 100 golpes, que são iniciados com a tecla e confirmo com mode enter, no final dos quais insiro a quantidade aspirada pela bomba com as teclas ⊕ ⊖ e confirmo com mode enter. O dado inserido será utilizado nos cálculos das vazões.

Parágrafo 12 - Estatísticas

Programação	Funcionamento
	No menu principal visualiza as horas de funcionamento da bomba, acionando a tecla mode enter acesso as outras estatísticas: - Strokes = número de golpes executados pela bomba - Q.ty(L) = quantidade dosada pela bomba expressa em litros; este dado é calculado com base no valor cc/stroke na memória - Power = número de acionamentos da bomba Reset = as teclas ⊕ ⊖ decido se zerar os contadores (YES) ou ainda não (NO), com mode enter confirmo. A pressão de ESC permite voltar ao menú principal.

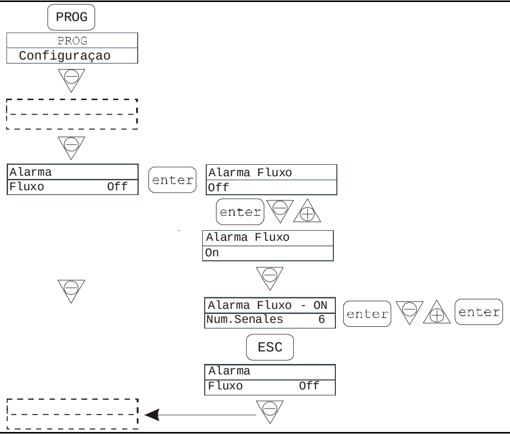
PROG
PROG
Configuraçao
Estatistica
Horas 10
enter
Estatistica
Inyecciones 1000
Estatistica
Cantidad (L) 100
Estatistica
Comeces 10
Estatistica
Reset
enter
Reset Estadist.
NO
enter
ESC
Estatistica
Horas 10

Parágrafo 13 - Senha

Programação	Funcionamento
	Inserindo a senha, poderei entrar em programação e ver todos os valores selecionados, mas cada vez que tentar modifica-los será pedida a senha. A linha lampejante indica o número modificável, com a tecla ⊕ seleciono o número (de 1 a 9), com a tecla ⊖ seleciono o número a modificar, a seguir com mode enter confirmo. Selecionando “0000” (fábrica), a senha será excluída.

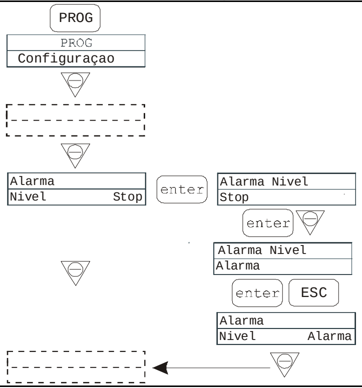
PROG
PROG
Configuraçao
Password
****
enter
Password
0000
enter

Parágrafo 14 - Alarme de Fluxo

Programação	Funcionamento
	Permite ativar (desativar) o sensor de fluxo. Uma vez ativado (On) acionando a tecla ⊖ se acessa a requisição de quantos sinais a bomba espera antes de entrar em alarme. Acionando mode enter lampeja o número, a seguir, com as teclas ⊕ ⊖ seleciono o valor. Com mode enter confirmo. Acionando ESC volto ao menu principal

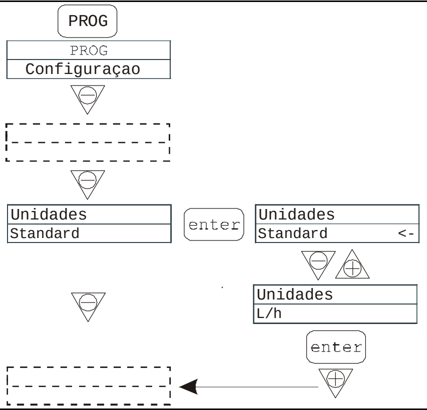
PROG
PROG
Configuraçao
Alarma
Fluxo Off
enter
Alarma Fluxo
Off
enter
Alarma Fluxo
On
Alarma Fluxo - ON
Num.Senales 6
enter
enter
ESC
Alarma
Fluxo Off

Parágrafo 15 - Alarme de Nível

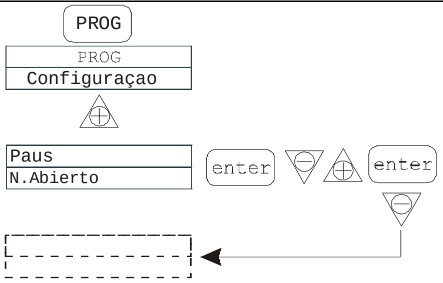
Programação	Funcionamento
	Permite selecionar a bomba quando se ativa o alarme do sensor de nível, isto é ,se bloquear a dosagem (Stop), ou ainda se simplesmente ativar a sinalização de alarme sem bloquear a dosagem. Acionando mode enter se acessa a modificação, a seguir com as teclas ⊕ ⊖ seleciono o tipo de alarme. Com mode enter confirmo. Acionando ESC volto ao menu principal

PROG
PROG
Configuraçao
Alarma
Nivel Stop
enter
Alarma Nivel
Stop
enter
Alarma Nivel
Alarma
enter
ESC
Alarma
Nivel Alarma

Parágrafo 16 - Unidade de visualização de vazão

Programação	Funcionamento
 PROG PROG Configuraçao Unidades Standard enter Unidades Standard <- Unidades L/h enter	Permite selecionar a unidade de medida da dosagem no display em visualização. Acionando mode enter se acessa a modificação, a seguir, com as teclas ⊕ ⊖ seleciono o tipo de unidade de medida, L/h (Litros/hora), Gph (Galões/hora), ml/m (mililitros/minuto) ou Standard (% ou freqüência, conforme foi selecionado). Com mode enter confirmo e volto ao menu principal

Parágrafo 17 – Ajuste Pausa

Programação	Funcionamento
 PROG PROG Configuraçao Paus N.Abierto enter enter	Entrada remota para colocar a bomba em pausa. Na fábrica o sistema é ajustado como Normalmente Aberto. Ao premir mode enter poderá ter acesso à alteração. Com as teclas ⊕ ⊖ poderá ajustar o valor (N. ABERTO ou N. FECHADO) Com mode enter poderá confirmar e voltar ao menu principal.

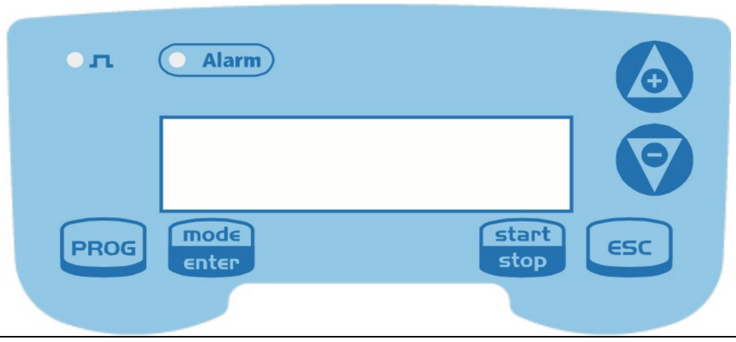
Ajuste do contraste do display.

Para ajustar o contraste o display manter apertou o esc durante 5 segundos, apertar ⊕ o ⊖ para aumentar ou disminuir o contraste.

Alarmes

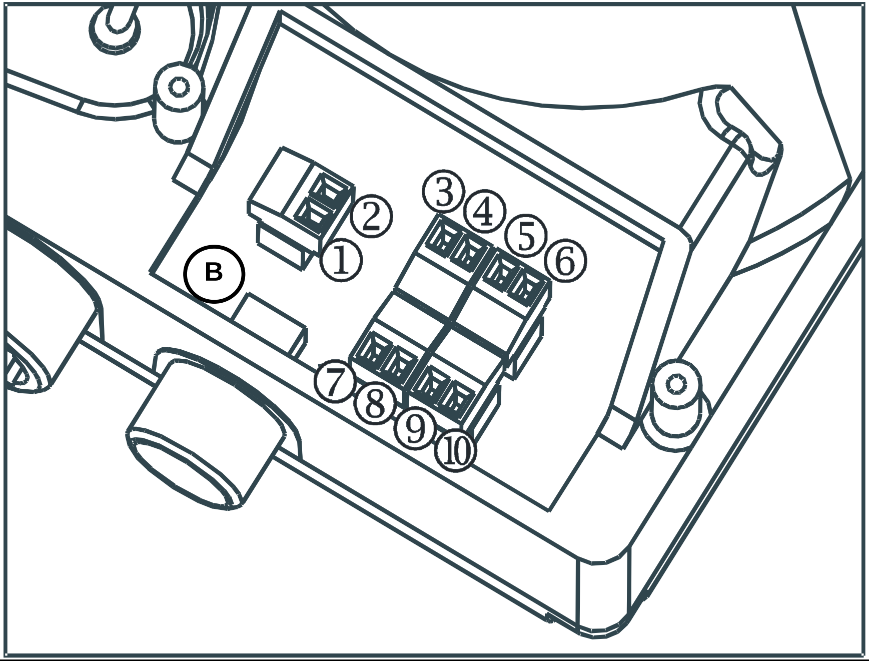
Visualização	**Causa**	**Interrupção**
Led Alarme fixo Escrita lev lampejante Ex: `Man` `Lev            P100%`	Alarme de fim de nível, sem interrupção do funcionamento da bomba	Restauração do nível do líquido.
Led Alarme fixo Escrita lev e stop lampejante Ex: `Man` `Lev   Stop     P100%`	Alarme de fim de nível, com interrupção de funcionamento da bomba	Restauração do nível do líquido
Escrita Mem lampejante Ex: `1:n                 6` `Mem`	A bomba recebe um ou mais impulsos durante a dosagem com função memory em Off	Pressionar al tecla start stop
Escrita Mem lampejante Ex: `1:n        M        6` `Mem`	A bomba recebe um ou mais impulsos durante a dosagem com função memory em On	Quando a bomba acaba de receber os impulsos externos devolve os golpes memorizados
Led Alarme fixo Escrita Flw lampejante Ex: `Man    F` `Flw            P100%`	Alarme de fluxo ativo, a bomba não recebeu o número de sinais programados pelo sensor de fluxo.	Pressionar a tecla start stop
Ex: `Parameter Error` `PROG to default`	Erro de comunicação interna da CPU.	Pressionar a tecla PROG para restaurar os parâmetros de default.

Kumanda Paneli – TEKNA TPG



PROG	Programlama menüsüne erişim
mode enter	Pompa çalışırken basıldığında, programlanan değerleri ekranda sırayla gösterir; ⊕ veya ⊖ tuşlarıyla aynı anda basıldığında, seçilen çalışma moduna bağlı olarak bir değeri artırır veya azaltır. Programlama sırasında bir “Enter” tuşu işlevi görerek çeşitli menü düzeylerine girişi ve bu düzeylerdeki değişiklikleri onaylar.
start stop	Pompayı çalıştırır ve durdurur. Bir düzey alarmı (yalnızca alarm işlevi), debi alarmı ve etkin bellek alarmı meydana gelmesi durumunda, ekrandaki sinyali devre dışı bırakır.
ESC	Çeşitli menü düzeylerinden “çıkmak” için kullanılır. Programlama aşamasından tamamen çıkmadan ön değişiklikleri kaydetmek isteyip istemediğiniz sorulur.
⊕	Menüde yukarı doğru hareket etmek veya değiştirilecek sayısal değerleri artırmak için kullanılır. Batch (Toplu işletim) modunda dozajlamayı başlatmak için kullanılabilir
⊖	Menüde aşağı doğru hareket etmek veya değiştirilecek sayısal değerleri azaltmak için kullanılır.
⎍ ○	Dozajlama sırasında yeşil LED yanıp söner
Alarm ○	Çeşitli alarm durumlarında yanan kırmızı LED

Elektrik bağlantıları



1	Alarm rölesi	
2		
3	+ kutbu	4-20 mA giriş sinyali Giriş Empedansı: 200 ohm
4	- kutbu	
5	-Uzaktan kumanda girişi (çalıştır-durdur)	
6	-Giriş Sinyal Duraklat	
7	-Frekans sinyali girişi (su sayacı darbe göndericisi)	
8	-Harici tetikl girişi	
9	Debi sensörü girişi	
10		
B	Giriş düzeyi kontrolü	

Tekna TPG Programlama Menüsü

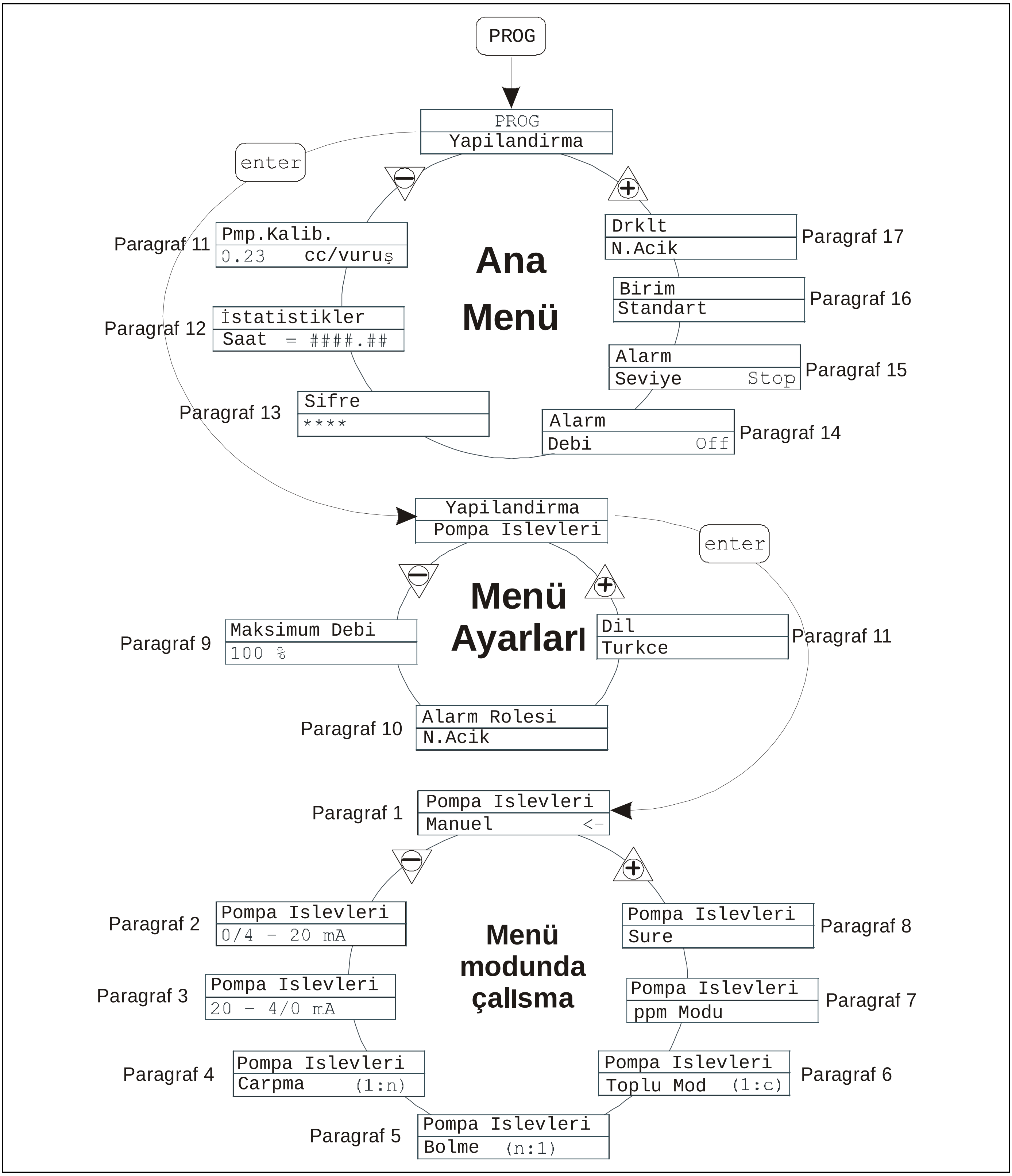
PROG tuşuna üç saniye kadar basarak programlama menüsüne erişebilirsiniz. Menü içinde gezinmek için ⊕ ⊖ tuşları, değişiklikler erişmek için mode enter tuşu kullanılabilir.
Pompa fabrikada sabit modda programlanmıştır. Pompa, 1 dakika herhangi bir işlem yapılmazsa otomatik olarak çalışma moduna döner. Bu durumda girilen veriler kaydedilmez.
ESC tuşu çeşitli programlama düzeylerinden çıkmak için kullanılabilir. Programlamadan çıkıldıktan sonra, şu ekran görüntülenir:

Exit (Çık)
Don’t Save

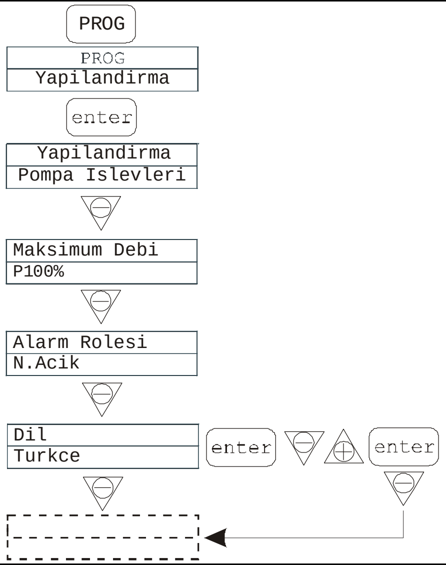
∇ Δ

Exit (Çık)
Save (Kaydet)

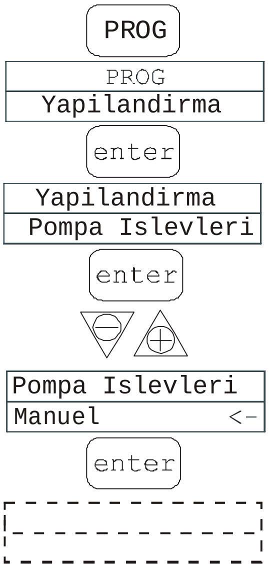
mode enter to confirm the selection (seçimi onaylamak için)

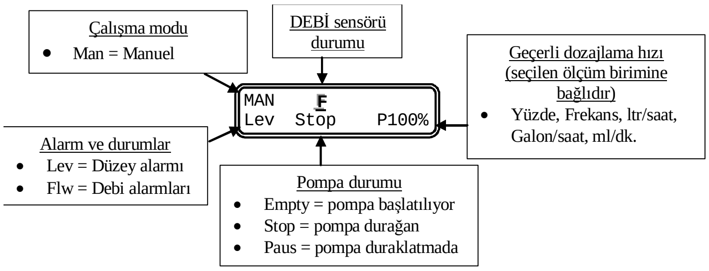
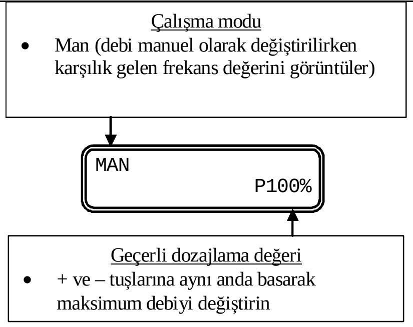

PROG
PROG
Yapilandirma
enter
Ana Menü
Paragraf 11
Pmp.Kalib.
0.23 cc/vuruş
Paragraf 12
İstatistikler
Saat = ####.##
Paragraf 13
Sifre
****
Drklt
N.Acik
Paragraf 17
Birim
Standart
Paragraf 16
Alarm
Seviye Stop
Paragraf 15
Alarm
Debi Off
Paragraf 14
Yapilandirma
Pompa Islevleri
enter
Menü Ayarları
Paragraf 9
Maksimum Debi
100 %
Dil
Turkce
Paragraf 11
Paragraf 10
Alarm Rolesi
N.Acik
Paragraf 1
Pompa Islevleri
Manuel <-
Menü modunda çalısma
Paragraf 2
Pompa Islevleri
0/4 - 20 mA
Paragraf 3
Pompa Islevleri
20 - 4/0 mA
Paragraf 4
Pompa Islevleri
Carpma (1:n)
Paragraf 5
Pompa Islevleri
Bolme (n:1)
Paragraf 6
Pompa Islevleri
Toplu Mod (1:c)
Paragraf 7
Pompa Islevleri
ppm Modu
Paragraf 8
Pompa Islevleri
Sure

Dili Ayarlama

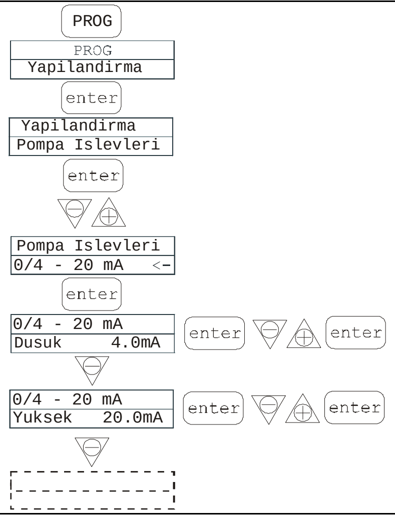
Programlama	**İşlem**
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri Maksimum Debi P100% Alarm Rolesi N.Acik Dil Turkce enter enter	Dili seçmenize olanak sağlar. Pompa menü dili fabrikada İngilizce'ye ayarlanmıştır. mode enter tuşuna basıp ardından yeni değeri girmek için ⊕ ⊖ tuşlarına basılarak değişiklik yapılabilir. Onaylamak ve ana menüye dönmek için mode enter tuşuna basın

Paragraf 1 – Manual Dosage (Manuel Dozajlama)

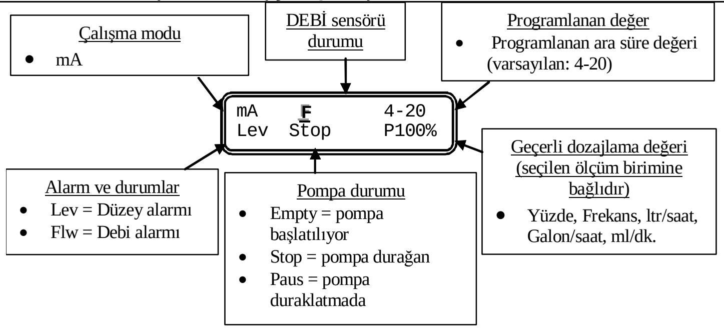
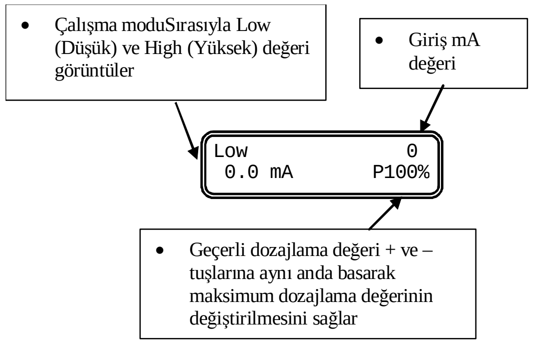
Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri enter Pompa Islevleri Manuel <- enter	Pompa, sabit modda çalışır. Debi, mode enter ⊕ tuşlarına aynı anda basıp artırılarak veya mode enter ⊖ tuşlarına basıp azaltılarak yalnızca manuel olarak ayarlanabilir.

Operation (Çalışma) sırasındaki ekran	Setting (Ayarlama) sırasındaki ekran (MODE tuşu)
 MAN F Lev Stop P100% Çalışma modu • Man = Manuel DEBİ sensörü durumu Geçerli dozajlama hızı (seçilen ölçüm birimine bağlıdır) • Yüzde, Frekans, ltr/saat, Galon/saat, ml/dk. Alarm ve durumlar • Lev = Düzey alarmı • Flw = Debi alarmları Pompa durumu • Empty = pompa başlatılıyor • Stop = pompa durağan • Paus = pompa duraklatmada	 Çalışma modu • Man (debi manuel olarak değiştirilirken karşılık gelen frekans değerini görüntüler) Geçerli dozajlama değeri • + ve – tuşlarına aynı anda basarak maksimum debiyi değiştirin

Paragraf 2 - Dosage Proportional to Signal 0/4-20 (0/4-20 Sinyaline Orantılı Dozajlama)

Programlama	İşlem
	Pompa (0)4-20 mA arasında bir sinyalde orantılı olarak dozajlama gerçekleştirir. Fabrika ayarlarına bağlı olarak, pompa dozajlamayı 4 mA sinyalinde durdurur ve 20 mA sinyal aldığında ayarlanan maksimum frekansla dozajlama gerçekleştirir. Bu iki değer, programlama sırasında değiştirilebilir. Maksimum frekans, mode enter ⊕ tuşlarına aynı anda basıp artırılarak veya mode enter ⊖ tuşlarına basıp azaltılarak pompa çalışırken değiştirilebilir.

PROG
PROG
Yapilandirma
enter
Yapilandirma
Pompa Islevleri
enter
Pompa Islevleri
0/4 - 20 mA <-
enter
0/4 - 20 mA
Dusuk 4.0mA
enter
enter
0/4 - 20 mA
Yuksek 20.0mA
enter
enter

Operation (Çalışma) sırasındaki ekran	Setting (Ayarlama) sırasındaki ekran (MODE tuşu)
	

mA F 4-20
Lev Stop P100%
Low 0
0.0 mA P100%

Çalışma modu
- mA

DEBİ sensörü durumu

Programlanan değer
- Programlanan ara süre değeri (varsayılan: 4-20)

Alarm ve durumlar
- Lev = Düzey alarmı
- Flw = Debi alarmı

Pompa durumu
- Empty = pompa başlatılıyor
- Stop = pompa durağan
- Paus = pompa duraklatmada

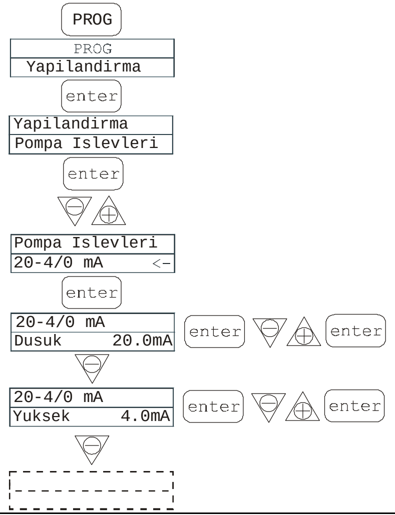
Geçerli dozajlama değeri (seçilen ölçüm birimine bağlıdır)
- Yüzde, Frekans, ltr/saat, Galon/saat, ml/dk.

- Çalışma moduSırasıyla Low (Düşük) ve High (Yüksek) değeri görüntüler

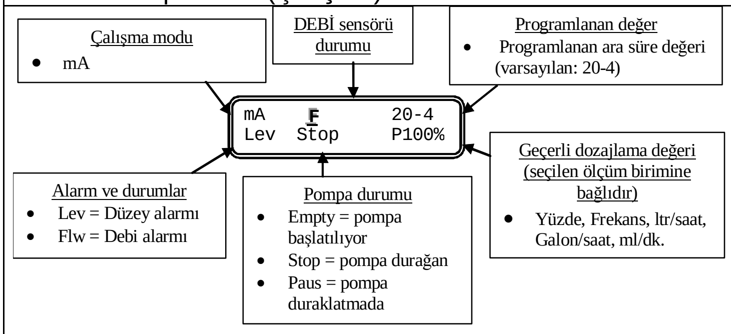
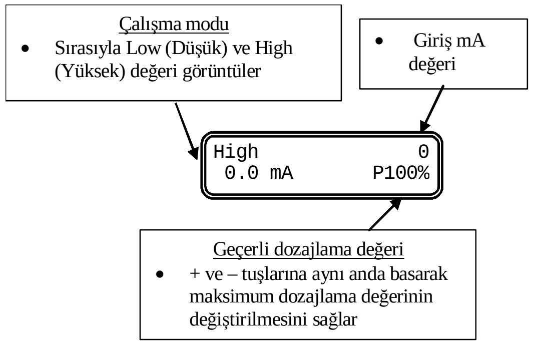
- Giriş mA değeri

- Geçerli dozajlama değeri + ve – tuşlarına aynı anda basarak maksimum dozajlama değerinin değiştirilmesini sağlar

Paragraf 3 - Dosage Proportional to Signal 20-4/0 (20-4/0 Sinyaline Orantılı Dozajlama)

Programlama	İşlem
	Pompa 20-4(0) mA arasında bir sinyalde orantılı olarak dozajlama gerçekleştirir. Fabrika ayarlarına bağlı olarak, pompa dozajlamayı 20 mA sinyalinde durdurur ve 4 mA sinyal aldığında ayarlanan maksimum frekansla dozajlama gerçekleştirir. Bu iki değer, programlama sırasında değiştirilebilir. Maksimum frekans, mode enter ⊕ tuşlarına aynı anda basıp artırılarak veya mode enter ⊖ tuşlarına basıp azaltılarak pompa çalışırken değiştirilebilir.

PROG
PROG
Yapilandirma
enter
Yapilandirma
Pompa Islevleri
enter
Pompa Islevleri
20-4/0 mA <-
enter
20-4/0 mA
Dusuk 20.0mA
enter
enter
20-4/0 mA
Yuksek 4.0mA
enter
enter

Operation (Çalışma) sırasındaki ekran	Setting (Ayarlama) sırasındaki ekran (MODE tuşu)
	

mA F 20-4
Lev Stop P100%
High 0
0.0 mA P100%

Çalışma modu
- mA

DEBİ sensörü durumu

Programlanan değer
- Programlanan ara süre değeri (varsayılan: 20-4)

Alarm ve durumlar
- Lev = Düzey alarmı
- Flw = Debi alarmı

Pompa durumu
- Empty = pompa başlatılıyor
- Stop = pompa durağan
- Paus = pompa duraklatmada

Geçerli dozajlama değeri (seçilen ölçüm birimine bağlıdır)
- Yüzde, Frekans, ltr/saat, Galon/saat, ml/dk.

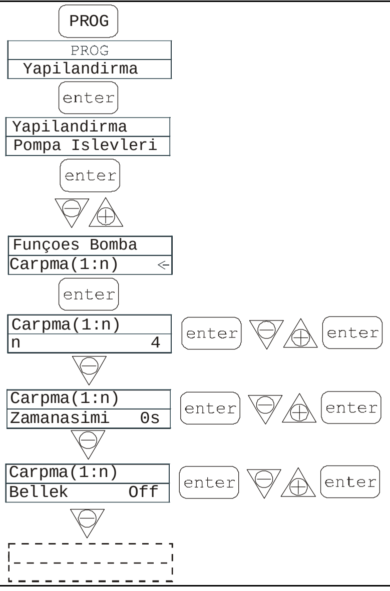
Çalışma modu
- Sırasıyla Low (Düşük) ve High (Yüksek) değeri görüntüler

- Giriş mA değeri

Geçerli dozajlama değeri
- + ve – tuşlarına aynı anda basarak maksimum dozajlama değerinin değiştirilmesini sağlar

Paragraf 4 – Proportional to External Impulses (Harici Darbelere Orantılı) (çarpanlı)

Programlama

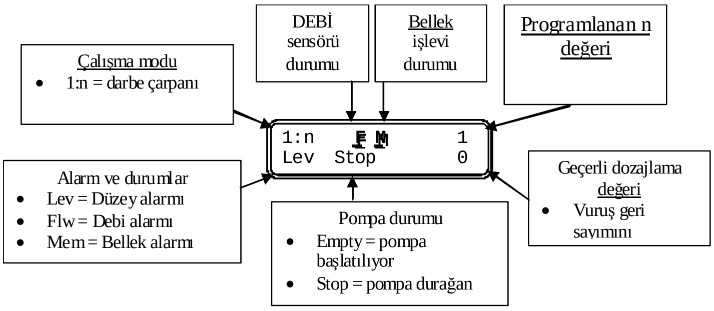

PROG
PROG
Yapilandirma
enter
Yapilandirma
Pompa Islevleri
enter
Funçoes Bomba
Carpma(1:n) <
enter
Carpma(1:n)
n 4
enter
enter
Carpma(1:n)
Zamanasimi 0s
enter
enter
Carpma(1:n)
Bellek Off
enter
enter

İşlem

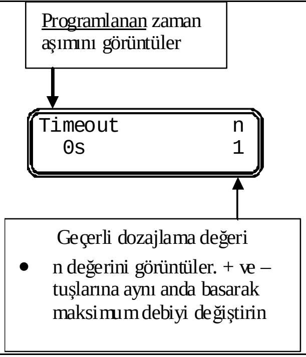
Pompa, harici bir sinyale (örn. sinyal darbe sayacı) orantılı olarak dozajlama gerçekleştirir. Pompa, alınan her sinyalde programlanan “n” sayıda vuruş gerçekleştirir. Pompa, dozajlama frekansını ard arda iki sinyal arasında geçen süreye uyarlayarak otomatik olarak ayarlar. Süre (zaman aşımı) saniye cinsinden ayarlanabilir; bu, dozajlamanın çok uzun süreler boyunca yapılmasını önlemek için pompanın belirlenen değer aşıldıktan sonra ara süre sayacını sıfırladığı süredir. Pompa, dozajlama sırasında sinyal alımını gösteren bir bellek işlevine sahiptir. Off (Kapalı) olarak ayarlanırsa, yalnızca bir sinyal gönderir; On (Açık) olarak ayarlanırsa, bir sinyal gönderip darbeleri hafızaya alır ve sinyal alımı bittiğinde bu darbeleri yürütür.

"n" değeri, mode enter ⊕ tuşlarına aynı anda basıp artırılarak veya mode enter ⊖ tuşlarına basıp azaltılarak pompa çalışırken değiştirilebilir.

Operation (Çalışma) sırasındaki ekran

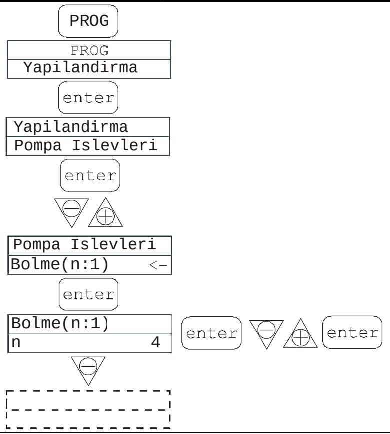

Çalışma modu
1:n = darbe çarpanı
DEBİ sensörü durumu
Bellek işlevi durumu
Programlanan n değeri
1:n F M 1
Lev Stop 0
Alarm ve durumlar
Lev = Düzey alarmı
Flw = Debi alarmı
Mem = Bellek alarmı
Pompa durumu
Empty = pompa başlatılıyor
Stop = pompa durağan
Geçerli dozajlama değeri
Vuruş geri sayımını

Setting (Ayarlama) sırasındaki ekran (MODE tuşu)


Programlanan zaman aşımını görüntüler
Timeout n
0s 1
Geçerli dozajlama değeri
n değerini görüntüler. + ve – tuşlarına aynı anda basarak maksimum debiyi değiştirin

Paragraph 5 – Proportional to External Impulses (division)

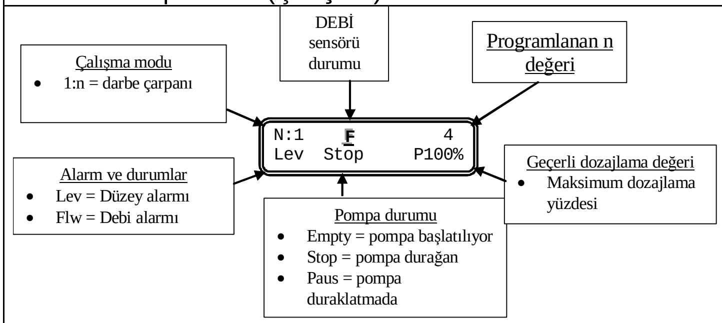
Programlama


PROG
PROG
Yapilandirma
enter
Yapilandirma
Pompa Islevleri
enter
Pompa Islevleri
Bolme(n:1) <-
enter
Bolme(n:1)
n 4
enter
enter

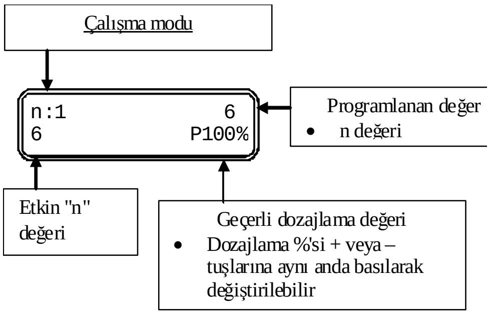
İşlem

Pompa, harici bir sinyale (örn. sinyal darbe sayacı) orantılı olarak dozajlama gerçekleştirir. Her “n” sinyalde, pompa bir vuruş gerçekleştirir. Programlama sırasında “n” değerini ayarlayabilirsiniz. “n” değerini programlayarak maksimum dozaj %'ni ayarlarsınız. Bu değer, mode enter ⊕ tuşlarına aynı anda basıp debi artırılarak veya mode enter ⊖ tuşlarına basıp debi azaltılarak pompa çalışırken değiştirilebilir.

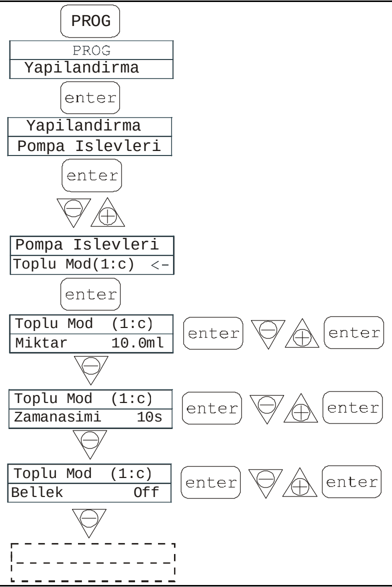
Operation (Çalışma) sırasındaki ekran

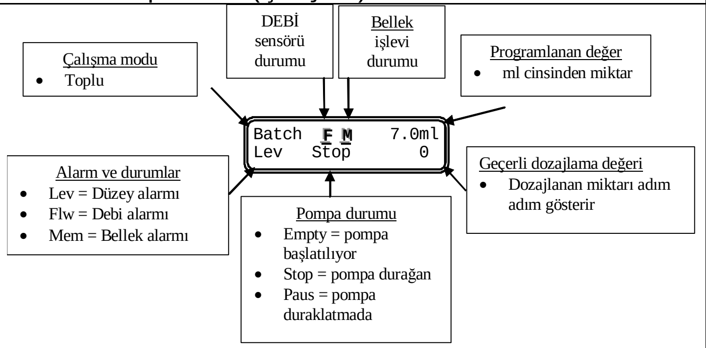
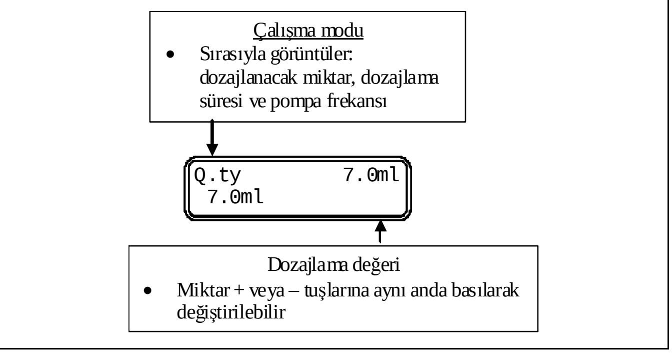

Çalışma modu
1:n = darbe çarpanı
DEBİ sensörü durumu
Programlanan n değeri
N:1 F 4
Lev Stop P100%
Alarm ve durumlar
Lev = Düzey alarmı
Flw = Debi alarmı
Pompa durumu
Empty = pompa başlatılıyor
Stop = pompa durağan
Paus = pompa duraklatmada
Geçerli dozajlama değeri
Maksimum dozajlama yüzdesi

Setting (Ayarlama) sırasındaki ekran (MODE tuşu)

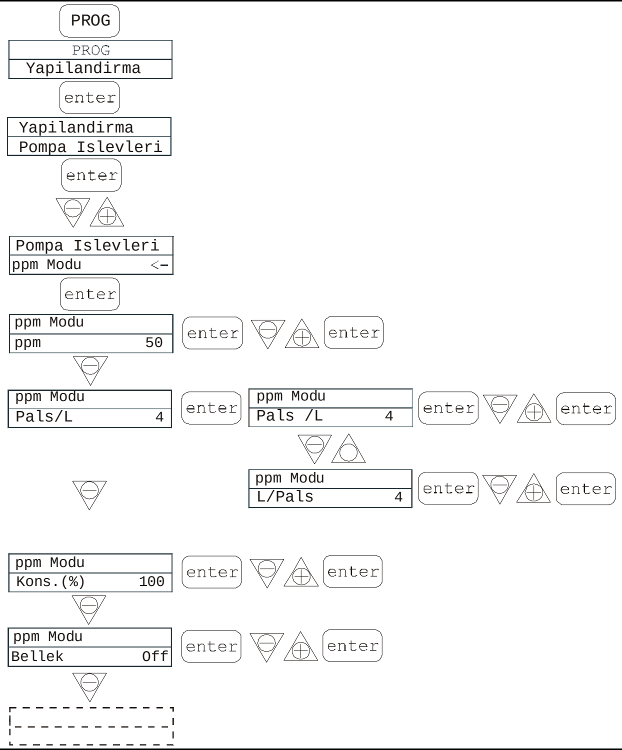

Çalışma modu
n:1 6
6 P100%
Programlanan değer
n değeri
Etkin "n" değeri
Geçerli dozajlama değeri
Dozajlama %'si + veya – tuşlarına aynı anda basılarak değiştirilebilir

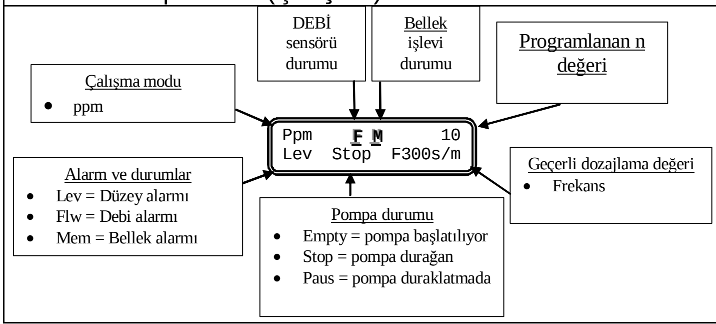
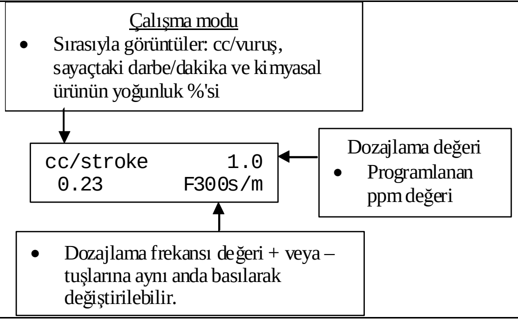
Paragraf 6 – Proportional to External Impulses (Harici Darbelere Orantılı) (toplu dozajıama)

Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri enter Pompa Islevleri Toplu Mod(1:c) <- enter Toplu Mod (1:c) Miktar 10.0ml enter enter Toplu Mod (1:c) Zamanasimi 10s enter enter Toplu Mod (1:c) Bellek Off enter enter	Pompa, harici bir sinyale (örn. sinyal darbe sayacı) orantılı olarak dozajlama gerçekleştirir. Bu durumda, ml cinsinden dozajlanacak miktar ve dozajlamanın tamamlanacağı süre ayarlanabilir. Dozajlama ⊕ tuşuna basılarak veya bir uzaktan kumanda sinyali kullanılarak manuel olarak başlatılabilir. start stop tuşu dozajlamayı duraklatır, daha sonra ⊕ tuşuna basılarak dozajlama sıfırlanabilir veya start stop tuşuna yeniden basılarak tekrar başlatılabilir. Dozajlanacak miktar, mode enter ⊕ tuşlarına aynı anda basıp debi artırılarak veya mode enter ⊖ tuşlarına basıp debi azaltılarak pompa çalışırken değiştirilebilir.

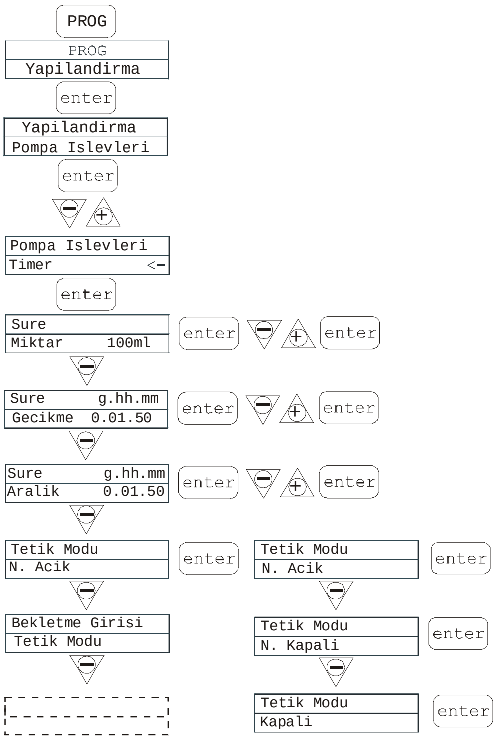
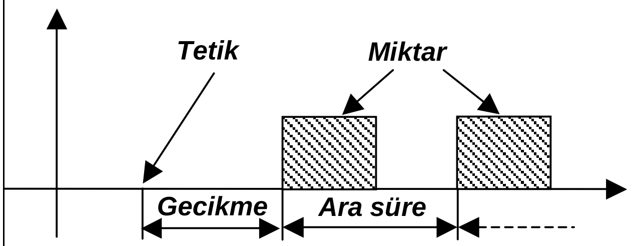
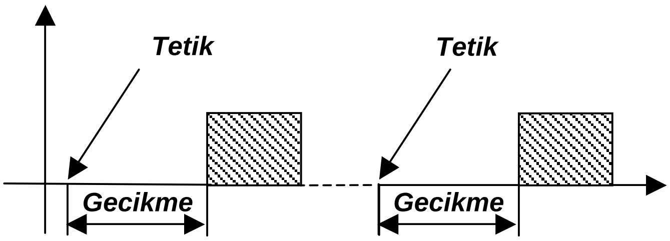
Operation (Çalışma) sırasındaki ekran	Setting (Ayarlama) sırasındaki ekran (MODE tuşu)
 Çalışma modu • Toplu DEBİ sensörü durumu Bellek işlevi durumu Programlanan değer • ml cinsinden miktar Batch F M 7.0ml Lev Stop 0 Alarm ve durumlar • Lev = Düzey alarmı • Flw = Debi alarmı • Mem = Bellek alarmı Pompa durumu • Empty = pompa başlatılıyor • Stop = pompa durağan • Paus = pompa duraklatmada Geçerli dozajlama değeri • Dozajlanan miktarı adım adım gösterir	 Çalışma modu • Sırasıyla görüntüler: dozajlanacak miktar, dozajlama süresi ve pompa frekansı Q.ty 7.0ml 7.0ml Dozajlama değeri • Miktar + veya – tuşlarına aynı anda basılarak değiştirilebilir

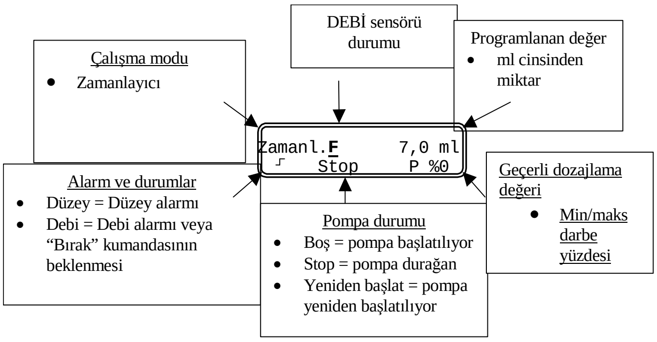
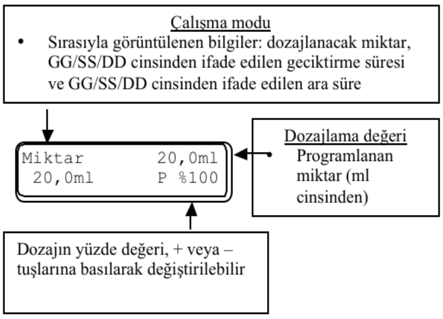
Paragraf 7 – Proportional to External Impulses (Harici Darbelere Orantılı) (ppm dozajlama)

Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri enter Pompa Islevleri ppm Modu <- enter ppm Modu ppm 50 enter enter ppm Modu Pals/L 4 enter ppm Modu Pals /L 4 enter enter ppm Modu L/Pals 4 enter enter ppm Modu Kons.(%) 100 enter enter ppm Modu Bellek Off enter enter	Pompa, harici bir sinyale (örn. darbe başlatma sayacı) orantılı olarak dozajlama gerçekleştirir; bunu, programlanan ppm değerini esas alarak gelen sinyaller ile pompa vuruşları arasındaki ilişkiyi otomatik olarak hesaplayarak yapar. Girilmesi gereken değerler ppm değeri, sayacın darbe/litre oranı (veya litre/darbe) ve dozajlanacak ürünün yoğunluğudur. Dozajlama frekansı, mode enter ⊕ tuşlarına aynı anda debi basıp artırılarak veya mode enter ⊖ tuşlarına basıp debi azaltılarak pompa çalışırken değiştirilebilir.

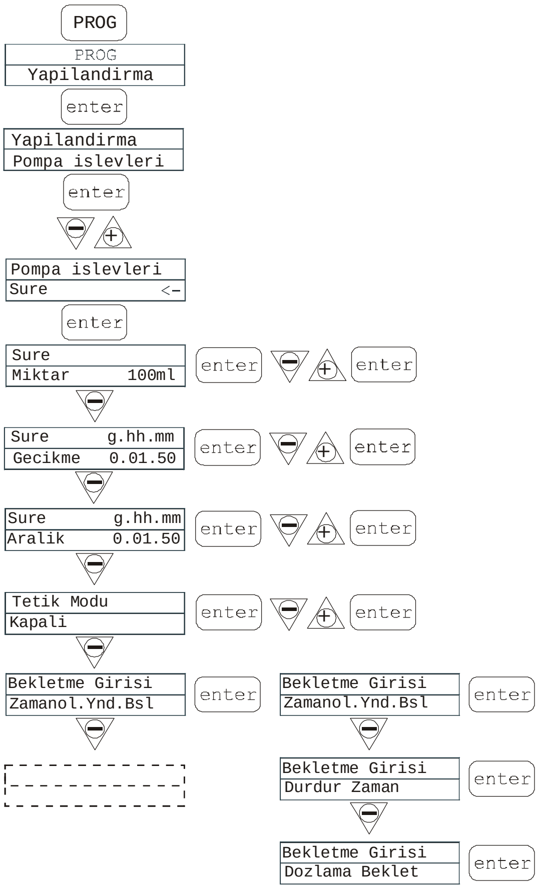
Operation (Çalışma) sırasındaki ekran	Setting (Ayarlama) sırasındakı ekran (MODE tuşu)
 DEBİ sensörü durumu Bellek işlevi durumu Programlanan n değeri Çalışma modu • ppm Ppm F M 10 Lev Stop F300s/m Geçerli dozajlama değeri • Frekans Alarm ve durumlar • Lev = Düzey alarmı • Flw = Debi alarmı • Mem = Bellek alarmı Pompa durumu • Empty = pompa başlatılıyor • Stop = pompa durağan • Paus = pompa duraklatmada	 Çalışma modu • Sırasıyla görüntüler: cc/vuruş, sayaçtaki darbe/dakika ve kimyasal ürünün yoğunluk %'si cc/stroke 1.0 0.23 F300s/m Dozajlama değeri • Programlanan ppm değeri • Dozajlama frekansı değeri + veya – tuşlarına aynı anda basılarak değiştirilebilir.

Paragraph 8 – Timed Dosage (Zamanlanmış Dozajlama) **(“*TETIK*” aktif hale getirilmiş durumda)**

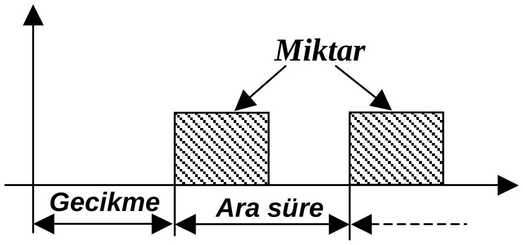
Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri enter Pompa Islevleri Timer <- enter Sure Miktar 100ml enter enter Sure g.hh.mm Gecikme 0.01.50 enter enter Sure g.hh.mm Aralik 0.01.50 enter enter Tetik Modu N. Acik enter Tetik Modu N. Acik enter Bekletme Girisi Tetik Modu Tetik Modu N. Kapali enter Tetik Modu Kapali enter	Pompa, girilen ***TETIK*** sinyalini aldıktan sonra ml cinsinden programlanabilen dozaj miktarını ayarlar. Aşağıdaki şemada gösterildiği üzere dozajlamadan önce bir geciktirme süresi (***Geciktirme***) ve iki ard arda dozaj işlemi arasındaki bir ara süre (***Ara süre***) ayarlanabilir:  Tetik Miktar Gecikme Ara süre Örneğin, eğer ***Ara süre*** = 0 girilirse, programlanan dozaj miktarının “ ***TETIK*** ” sinyali her alındığında verildiği bir sistem elde edilir (gerekirse girilen geciktirme süresi ile verilir):  Tetik Tetik Gecikme Gecikme Uygulamada ***“Bırak”*** sinyalini simüle eden + tuşuna basılarak ta dozaj işleminin başlatılması mümkündür. ***“ Tetik ”*** sinyali ***NO*** veya ***NF*** konumuna getirilebilir (birinci durumda girişin açık moddan kapalı moda geçtiğinde sinyal aktif hale gelir, ikincisinde ise girişin kapalı moddan açık moda geçtiğinde sinyal aktif hale gelir). ***“ Tetik ”*** sinyali dozaj işlemi sırasında bloke olur (sinyali alma işlemi ne kaydedilmez ne de yönetilmez). ***Duraklama*** girişi (***Uzaktan kumanda girişi***) programlanamaz ve aktif hale getirilirse dozaj işlemi bloke olur, halbuki bu girişin aktif halden çıkması halinde sistem yeni bir dozaj işlemine başlamak için “ ***Tetik*** ” sinyalini bekleme durumuna yeniden getirilir. Pompanın çalışma aşaması sırasında dozaj frekansını değiştirmek mümkündür. mode enter ⊕ tuşlarına aynı anda basılarak *frekans artırılır*, mode enter ⊖ tuşlarına aynı anda basılarak *frekans düşürülür*.

<table>
<tr><th>Operation (Çalışma) sırasındaki ekran</th><th>Setting (Ayarlama) sırasındaki ekran (MODE tuşu)</th></tr>
<tr><td>

Çalışma modu
• Zamanlayıcı
DEBİ sensörü durumu
Programlanan değer
• ml cinsinden miktar
Zamanl.F 7,0 ml
Stop P %0
Geçerli dozajlama değeri
• Min/maks darbe yüzdesi
Alarm ve durumlar
• Düzey = Düzey alarmı
• Debi = Debi alarmı veya “Bırak” kumandasının beklenmesi
Pompa durumu
• Boş = pompa başlatılıyor
• Stop = pompa durağan
• Yeniden başlat = pompa yeniden başlatılıyor
</td><td>

Çalışma modu
• Sırasıyla görüntülenen bilgiler: dozajlanacak miktar, GG/SS/DD cinsinden ifade edilen geciktirme süresi ve GG/SS/DD cinsinden ifade edilen ara süre
Miktar 20,0ml
20,0ml P %100
Dozajlama değeri
Programlanan miktar (ml cinsinden)
Dozajın yüzde değeri, + veya – tuşlarına basılarak değiştirilebilir
</td></tr>
</table>

Paragraph 8 – Timed Dosage (Zamanlanmış Dozajlama) **(“*TETIK*” aktif hale getirilmemiş durumda)**

<table>
<tr><th>Programlama</th><th>İşlem</th></tr>
<tr><td>

PROG
PROG
Yapilandirma
enter
Yapilandirma
Pompa islevleri
enter
Pompa islevleri
Sure <-
enter
Sure
Miktar 100ml
enter
enter
Sure g.hh.mm
Gecikme 0.01.50
enter
enter
Sure g.hh.mm
Aralik 0.01.50
enter
enter
Tetik Modu
Kapali
enter
enter
Bekletme Girisi
Zamanol.Ynd.Bsl
enter
Bekletme Girisi
Zamanol.Ynd.Bsl
enter
Bekletme Girisi
Durdur Zaman
enter
Bekletme Girisi
Dozlama Beklet
enter
</td><td>

Pompa ml cinsinden programlanabilen dozaj miktarını ayarlar. Aşağıdaki şemada gösterildiği üzere pompanın çalışmaya başladığı anda bir geciktirme süresi (***Geciktirme***) ve iki ard arda dozaj arasındaki süreyi (***Ara süre***) girmek mümkündür:


Miktar
Gecikme
Ara süre

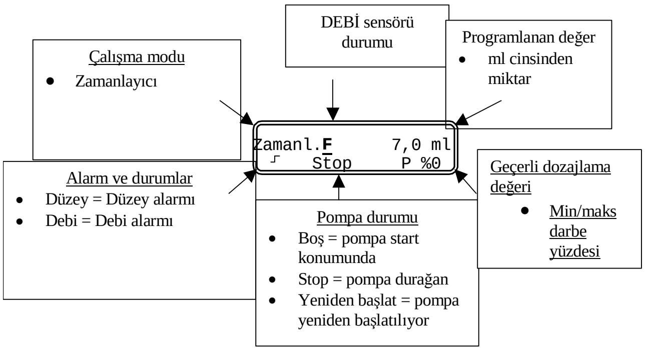
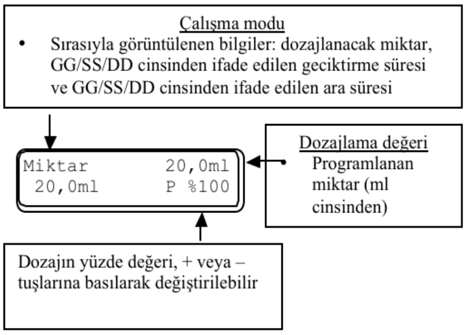
Geciktirme ve ***Ara süre*** süreleri GG/SS/DD (gün/saat/dakika) biçimindedir.

Duraklama girişi üç farklı modda programlanabilir:

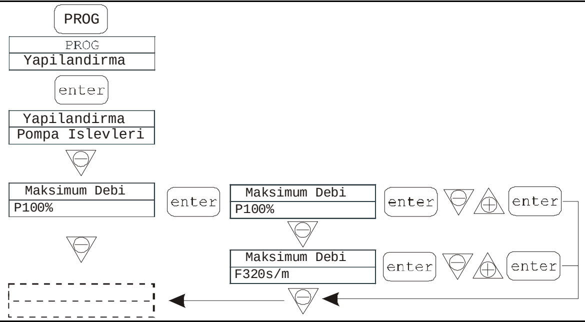
1. ***Zamanlayıcının kilitlenmesi***: duraklama aktif hale getirildiğinde, sistem zaman sayacını durdurur, duraklama aktif halden çıkarıldığında zaman sayacını yeniden çalıştırır.
2. ***Dozaj işlemi sırasında duraklama***: duraklama aktif hale getirildiğinde, sistem zaman sayacını çalıştırmaya devam edip dozaj işlemini durdurur.
3. ***Zamanlayıcının yeniden çalıştırılması***: duraklama aktif hale getirildiğinde, sistem dozaj işlemini durdurur ve duraklama aktif halden çıkarıldığında zaman sayacını yeniden başlangıçtan çalıştırır.

Pompanın çalışma aşaması sırasında dozaj frekansını değiştirmek mümkündür. mode enter ⊕ tuşlarına aynı anda basılarak ***frekans artırılır***, mode enter ⊖ tuşlarına aynı anda basılarak ***frekans düşürülür***.

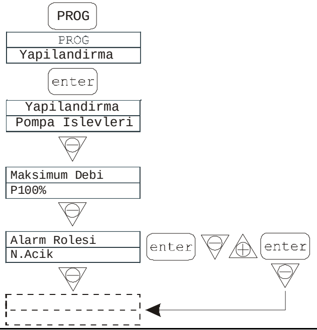
</td></tr>
</table>

<table>
<tr><th>Operation (Çalışma) sırasındaki ekran</th><th>Setting (Ayarlama) sırasındaki ekran (MODE tuşu)</th></tr>
<tr><td>

Çalışma modu
• Zamanlayıcı
DEBİ sensörü durumu
Programlanan değer
• ml cinsinden miktar
Zamanl.F 7,0 ml
Stop P %0
Geçerli dozajlama değeri
• Min/maks darbe yüzdesi
Alarm ve durumlar
• Düzey = Düzey alarmı
• Debi = Debi alarmı
Pompa durumu
• Boş = pompa start konumunda
• Stop = pompa durağan
• Yeniden başlat = pompa yeniden başlatılıyor
</td><td>

Çalışma modu
• Sırasıyla görüntülenen bilgiler: dozajlanacak miktar, GG/SS/DD cinsinden ifade edilen geciktirme süresi ve GG/SS/DD cinsinden ifade edilen ara süresi
Miktar 20,0ml
20,0ml P %100
Dozajlama değeri
Programlanan miktar (ml cinsinden)
Dozajın yüzde değeri, + veya – tuşlarına basılarak değiştirilebilir
</td></tr>
</table>

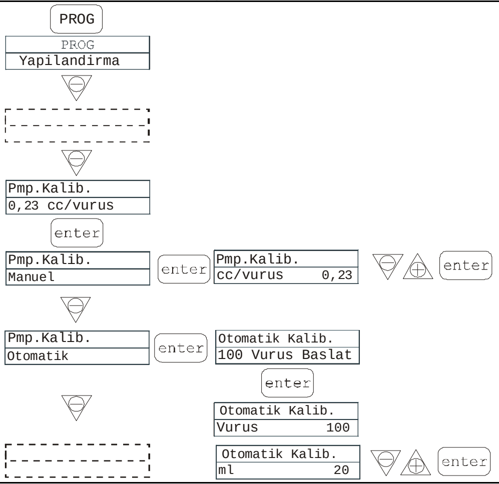
Paragraf 9 – Setting the Maximum Flow (Maksimum Debiyi Ayarlama)

Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri Maksimum Debi P100% enter Maksimum Debi P100% enter enter Maksimum Debi F320s/m enter enter	Bu özellik sayesinde, pompanın sağladığı maksimum debi ayarlanabilir ve debi görüntülenirken standart ölçü birimi olarak programlanan mod (% veya frekans) kullanılır. mode enter tuşuna basıp ardından yeni değeri girmek için ⊕ ⊖ tuşlarına basılarak değişiklik yapılabilir. Onaylamak ve ana menüye dönmek için mode enter tuşuna basın

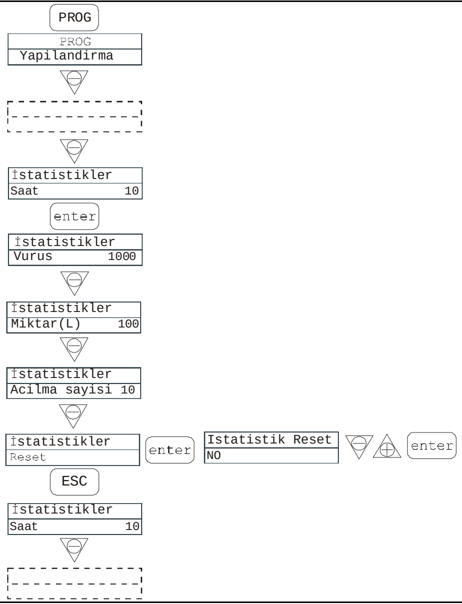
Paragraf 10 – Setting the Alarm Relay (Alarm Rölesini Ayarlama)

Programlama	İşlem
 PROG PROG Yapilandirma enter Yapilandirma Pompa Islevleri Maksimum Debi P100% Alarm Rolesi N.Acik enter enter	Bir alarm durumu olmadığında, açık (varsayılan) veya kapalı olarak ayarlanabilir. mode enter tuşuna basıp ardından yeni değeri girmek için ⊕ ⊖ tuşlarına basılarak değişiklik yapılabilir. Onaylamak ve ana menüye dönmek için mode enter tuşuna basın

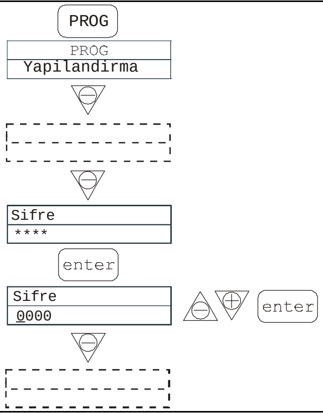
Paragraf 11 – Flow Calibration (Debi Kalibrasyonu)

Programlama	İşlem
 PROG PROG Yapilandirma Pmp.Kalib. 0,23 cc/vurus enter Pmp.Kalib. Manuel enter Pmp.Kalib. cc/vurus 0,23 enter Pmp.Kalib. Otomatik enter Otomatik Kalib. 100 Vurus Baslat enter Otomatik Kalib. Vurus 100 Otomatik Kalib. ml 20 enter	Ana menüde, hafızaya alınan vuruş başına cc değeri görünür. İki farklı şekilde kalibre edilebilir: MANUAL (MANUEL) – ⊕ ⊖ tuşlarını kullanarak vuruş başına cc değerini manuel olarak girin ve mode enter tuşuna basarak onaylayın AUTOMATIC (OTOMATİK)– pompa, mode enter tuşuna basılarak başlatılan 100 vuruş yapar. Bu işlemin sonunda, ⊕ ⊖ tuşlarını kullanarak pompa tarafından emilen miktarı girin ve mode enter tuşuna basarak onaylayın. Girilen sayı, debi hesaplamalarında kullanılacaktır.

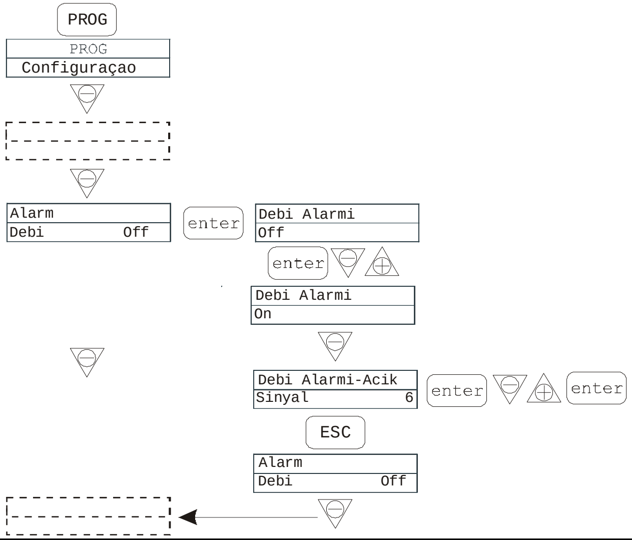
Paragraf 12 - Statistics (İstatistikler)

Programlama	İşlem
 PROG PROG Yapilandirma Istatistikler Saat 10 enter Istatistikler Vurus 1000 Istatistikler Miktar(L) 100 Istatistikler Acilma sayisi 10 Istatistikler Reset enter Istatistik Reset NO enter ESC Istatistikler Saat 10	Ana menüde pompanın çalışma süreleri görüntülenir. mode enter tuşuna basarak diğer istatistiklere erişebilirsiniz: - Strokes = pompa tarafından yapılan vuruş sayısı - Q.ty (L) = pompa tarafından yapılan litre cinsinden dozajlama miktarı; bu sayı, hafıza alınan cc/vuruş değeri esas alınarak hesaplanır - Power = pompanın başlatılma sayısı - Reset = ⊕ ⊖ tuşlarını kullanarak sayaçları sıfırlayın (YES) veya olduğu gibi bırakın (NO), ardından mode enter tuşuna basarak onaylayın. ESC tuşuna bastığınızda, ana menüye dönersiniz.

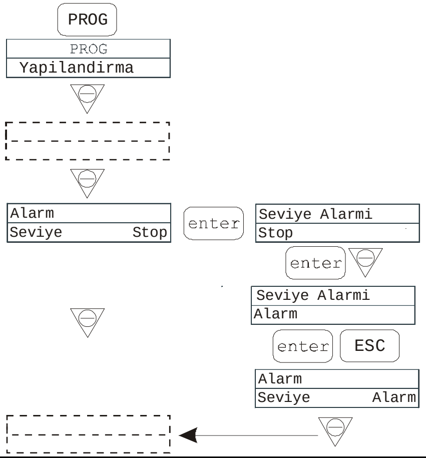
Paragraf 13 – Password (Parola)

Programlama	İşlem
 PROG PROG Yapilandirma Sifre **** enter Sifre 0000 enter	Parolayı girerek programlama menüsüne girebilir ve ayarlanan tüm değerleri görebilirsiniz. Bu ayarları değiştirmek istediğinizde her defasında parolayı girmeniz istenir. Yanıp sönen çizgi, değiştirilebilen rakamı gösterir. Rakamı (1 ila 9 arasında) seçmek için ⊕ tuşunu ve değiştirilecek rakamı seçmek için ⊖ tuşunu kullanın. mode enter tuşuna basarak onaylayın. “0000” (varsayılan) ayarlandığında, parola ortadan kaldırılır.

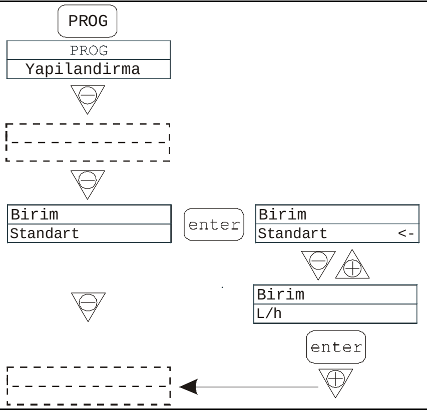
Paragraf 14 – Flow Alarm (Debi Alarmı)

Programlama	İşlem
 PROG PROG Configuraçao Alarm Debi Off enter Debi Alarmi Off enter Debi Alarmi On Debi Alarmi-Acik Sinyal 6 enter enter ESC Alarm Debi Off	Bu ayar, debi sensörünü etkinleştirmeyi (devre dışı bırakmayı) mümkün kılar. Etkinleştirildiğinde (On), bir alarm tetiklenmeden önce pompanın beklediği sinyal sayısı isteğine erişmek için ⊖ tuşuna basın. mode enter tuşuna basıldığında rakam yanıp sönmeye başlar, ardından ⊕ ⊖ tuşlarını kullanarak değer ayarlayabilirsiniz. mode enter tuşuna basarak onaylayın. Ana menüye dönmek için ESC tuşuna basın

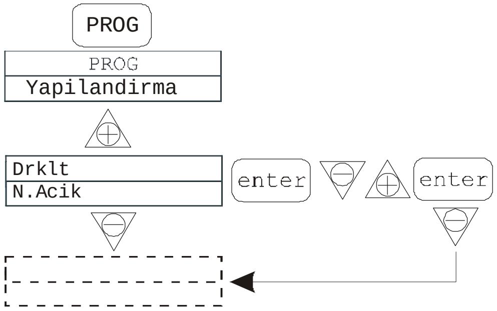
Paragraf 15 – Level Alarm (Düzey Alarmı)

Programlama	İşlem
 PROG PROG Yapilandirma Alarm Seviye Stop enter Seviye Alarmi Stop enter Seviye Alarmi Alarm enter ESC Alarm Seviye Alarm	Bu ayar, düzey sensörü alarmı etkin durumdayken pompanın ayarlanmasına olanak sağlar. Başka bir deyişle, dozajlamayı durdurmayı (Stop) veya dozajlamayı durdurmadan yalnızca alarm sinyalini etkinleştirmeyi seçebilirsiniz. mode enter tuşuna basıp ardından yeni değeri girmek için ⊕ ⊖ tuşlarına basılarak değişiklik yapılabilir. mode enter tuşuna basarak onaylayın. Ana menüye dönmek için ESC tuşuna basın

Paragraf 16 – Flow Display Unit (Debi Görüntüleme Birimi)

Programlama	İşlem
 PROG PROG Yapilandirma Birim Standart enter Birim Standart <- Birim L/h enter	Bu ayar, ekranda görüntülenecek dozajlama ölçü biriminin ayarlanmasına olanak sağlar. Değişiklikler, mode enter tuşuna basıp ardından ölçü birimini ayarlamak için ⊕ ⊖ tuşları ile L/h (litre/saat), Gph (Galon/saat), ml/m (milimetre/dakika) veya standart (ayarlara bağlı olarak % veya frekans) seçenekleri arasından seçim yapıp ölçü birimi ayarlanarak yapılabilir. Onaylamak ve ana menüye dönmek için mode enter tuşuna basın

Paragraf 17 - Setting the Pause (Duraklamayı Ayarlama)

Programlama	İşlem
 PROG PROG Yapilandirma Drklt N.Acik enter enter	Pompa, uzaktan giriş ile duraklatılabilir. Fabrika ayarı Normally Open (Normalde Açık) ayarıdır. mode enter tuşuna basıp ardından yeni değeri (N. OPEN (N. AÇIK) veya N. CLOSED (N. KAPALI)) girmek için ⊕ ⊖ tuşlarına basılarak değişiklik yapılabilir. Onaylamak ve ana menüye dönmek için mode enter tuşuna basın

Gosterge Kontrast Ayari

Gostergenin kontrast ayarini degistirmek icin ESC tusuna basili tutun ve 5 saniye icinde arttirmak yada azaltmak icin ⊕ yada ⊖ tuslarina basin.

Alarmlar

Ekran	Nedeni	Kesinti
Sabit alarm LED'i **Yanıp sönen "Lev" iletisi** **Örn.** Man Lev P100%	Pompa durdurulmadan düzey alarmının sonlandırılması	Sıvı seviyesini düzeltin.
Sabit alarm LED'i **Yanıp sönen "Lev" ve "stop" iletiler** **Örn.** Man Lev Stop P100%	Pompa durdurularak düzey alarmının sonlandırılması	Sıvı seviyesini düzeltin.
Yanıp sönen "Mem" iletisi **Örn.** 1:n 6 Mem	Bellek işlevi Off (Kapalı) durumdayken pompa bir veya birden çok darbe alır	start stop tuşuna basın
Yanıp sönen "Mem" iletisi **Örn.** 1:n M 6 Mem	Bellek işlevi On (Açık) durumdayken pompa bir veya birden çok darbe alır	Pompa harici darbe alımını bitirdiğinde, hafızaya alınan vuruşlara döner
Sabit alarm LED'i **Yanıp sönen "Flw" iletisi** **Örn.** Man F Flw P100%	Etkin debi alarmı. Pompa, debi sensöründen programlanan sayıda sinyal almamıştır.	start stop tuşuna basın
Örn. Parameter Error PROG to default	Dahili işlemci iletişim hatası.	Varsayılan parametreleri geri yüklemek için PROG tuşuna basın.

PR 40

INSTRUCTIONS MANUAL **EN**

HANDBUCH **DE**

MANUAL DE INSTALACION **ES**

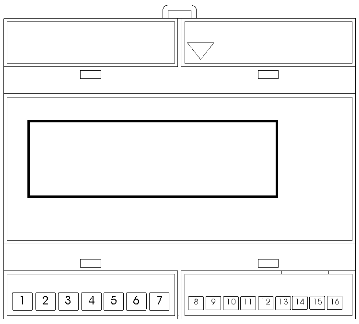
MANUEL D’INSTALLATION **FR**

MANUALE D’INSTALLAZIONE **IT**

MANUAL DE INSTALAÇÃO **PT**

KULLANIM KLAVUZU **TK**

pH or Redox measurement device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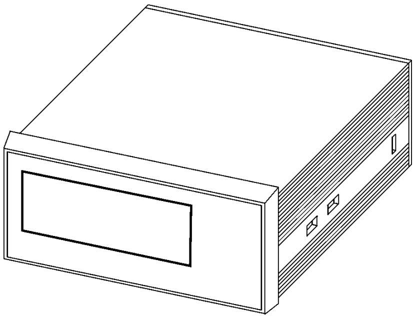
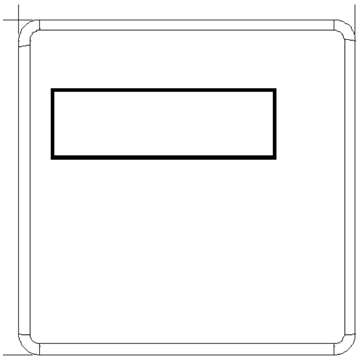
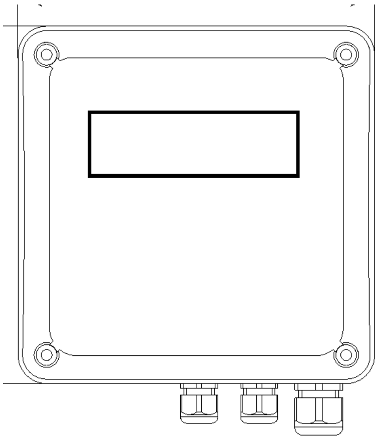






CONTENTS

1 First of all page 2
2 Installation page 3
3 Settings and Operation page 5
4 Troubleshooting page 11

1 FIRST OF ALL

1.1 WELCOME

➲ Please read this manual carefully, taking particular note of the warnings provided. Always apply the necessary safety procedures, including the use of adequate protection for your face, eyes, and clothing.

1.2 PACK CONTENT

- Measuring instrument
- Fixing brackets
- Instruction manual

1.3 TECHNICAL CHARACTERISTICS

Chemical measurement range: 0÷14.0 pH or ±1500 mV for Redox
Precision: 1% FS pH o 1% FS Redox

Chemical measurement input impedance: 1 x 10^{13} oHm
Chemical measurement probe connection: BNC
Probe calibration: Software assisted

Temperature measurement range: -10 to +100 °C (Resolution 1 °C)
Automatic temperature compensation from 0 to 100 °C by means of PT 100 sensor or manual setting of the instrument.

Relay output: Set Point 2 (max. resistance load: 10 A 250 VAC)

Current outputs: 1 (max. load 500 ohm) [Precision ±2% F.S.]

Input: 15÷30 VAC/DC

Power Supply: 90÷265 VAC 50/60 Hz
Power rating: 5VA Max
Fuses: 500 mA (delayed)

Display: 2-line 16-character LCD
Keyboard: 4 keys

Dimensions:

- DIN Rail panel-mounted;
- 48 x 96 x 98 mm panel-mounted,
- 96 x 96 panel-mounted,
- 144 x 144 wall-mounted.

Protection level:

- Din-Rail = IP40
- 48x96 = IP40
- 96x96 = IP65 Front panel
- 144x144 = IP65 Full box

1.4 WARNINGS

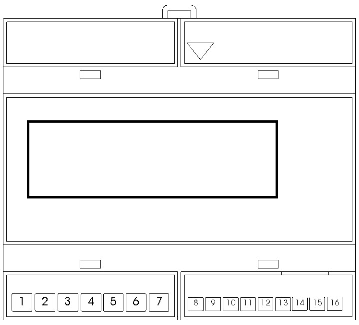
✋ Please read this manual carefully before installing and operating the system.
✋ The dosing unit must be connected to the power supply by means of an omnipolar switch with maximum contact separation of 3mm.
✋Check the purchased model for the installation, setting and programming references contained in this manual.
✋Refer to the control circuit map provided in this manual when making connections.
☠ CAUTION: **Always apply the necessary safety procedures, including the use of adequate eyes, face and hands personal protective equipment and the use of proper clothing.**
☠ CAUTION: **Before installing or servicing this equipment, always disconnect the power supply.**
➲ IT is always working towards perfecting its products and reserves the right to make changes at any time, without prior notice.
➲ Failure to abide by the standards laid down in this manual could result in damage to property or injury to people, as well as damaging the equipment or compromising its operation.

1.5 MATERIALS REQUIRED FOR INSTALLATION

Provide yourself with the necessary material for installing the instrument.

2 Mechanical and Electrical INSTALLATION

2.1.___DIN Rail Version (6 EN50022 DIN modules)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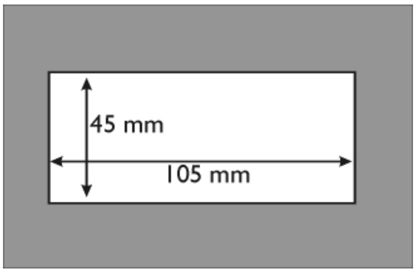
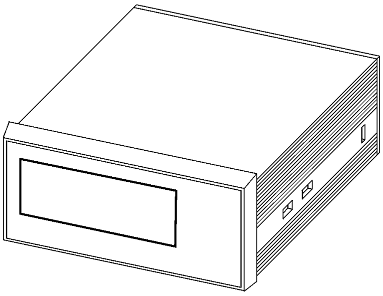
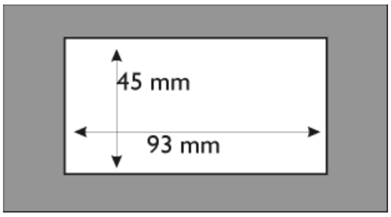
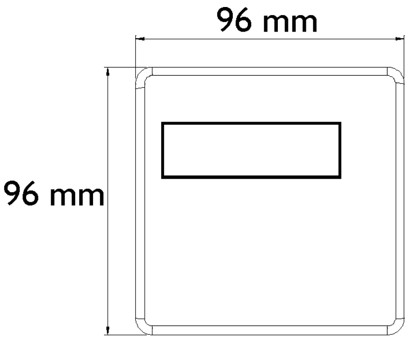


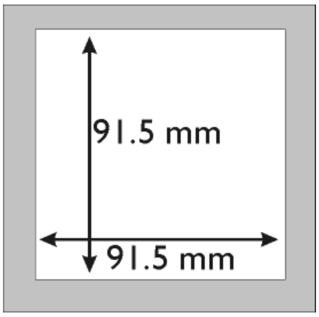
2.2___48 x 96 x 100 version



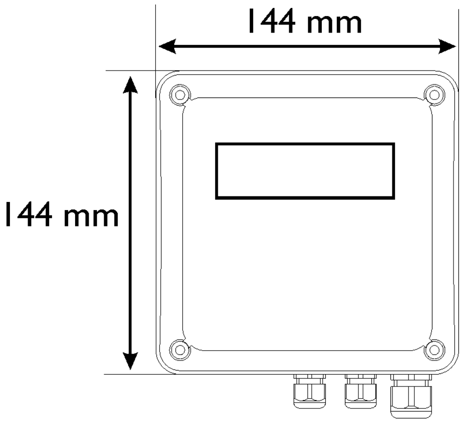


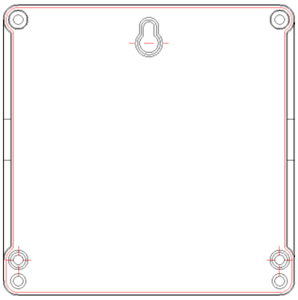
2.3___96 x 96 x 92 version

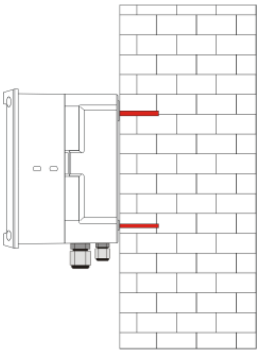



91.5 mm
91.5 mm

2.4__144 x 144 x 90 version


144 mm
144 mm



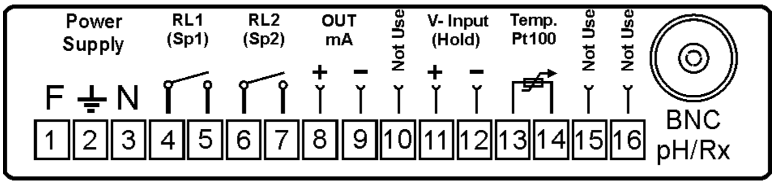


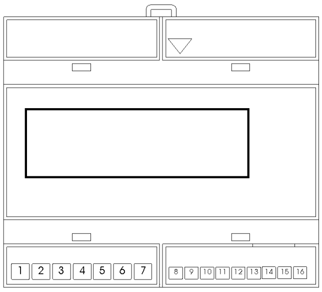
2.5 Description of electrical connections

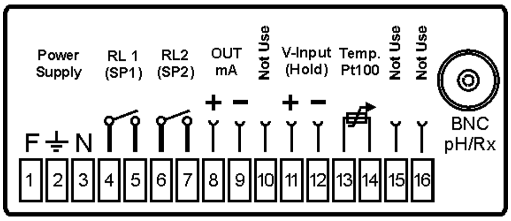
2.5.1__Electrical connection diagram

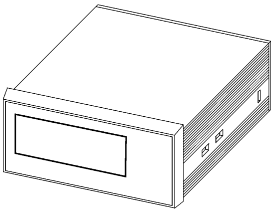
Terminal	Description
1	Phase (230 VAC supply)
2	Earth
3	Neutral (230 VAC supply)
4-5	Set Point 1 Relay
6-7	Set Point 2 Relay
8-9	0/4÷20 mA current output
10	Not used
11-12	VDC input VDC 15÷30 Vdc **Hold**
13-14	Temperature probe input
15-16	Not used
BNC	pH/Redox probe input

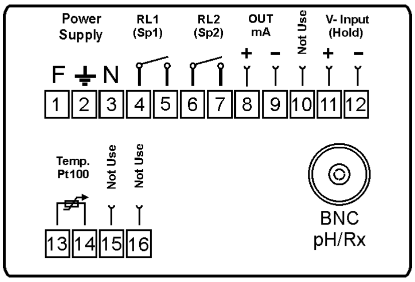
2.5.2__Electrical connection label for each model

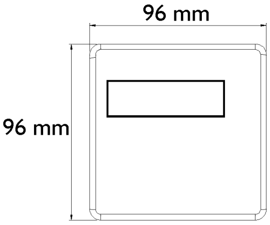

Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx

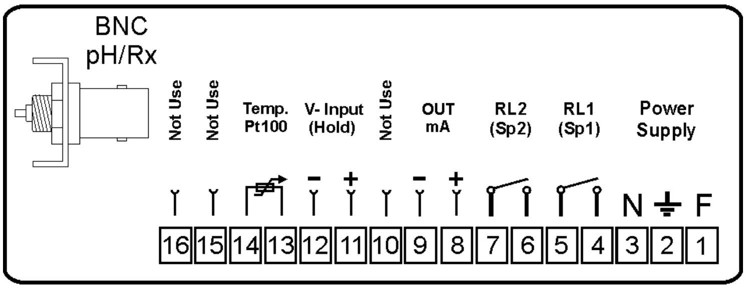

1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16

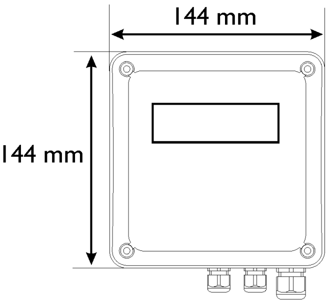

Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx




Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx




BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

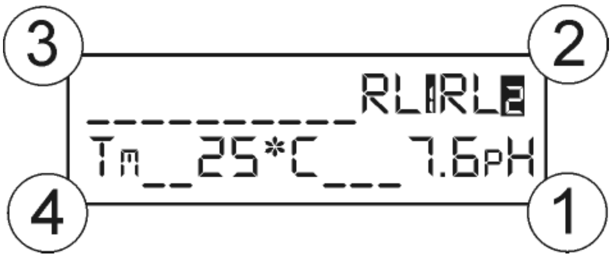

144 mm
144 mm

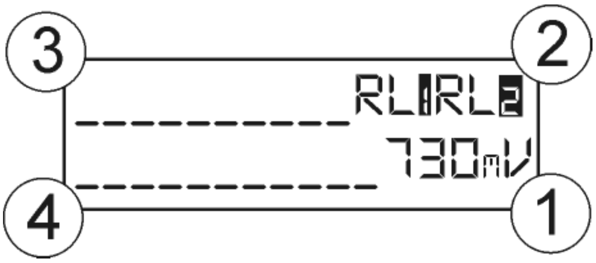
2.6 PLUMBING CONNECTIONS

None

3.0___SETTINGS AND OPERATION

3.1__Instrument Display





Area 1 = pH or Redox chemical measurement display
Area 2 = Relay 1 and 2 status display. If the relay's number is blinking, the contact has changed status.
Area 3 = Alarms display
Area 4 = Manual or automatic temperature display for pH measurement; this area is empty for Redox version.
Note: The RL2 icon becomes RLA when Set Point 2 is set as an Alarm.

3.2__Instrument keyboard

Esc/Mode = Double-function key: **Esc** = Immediate exit from menu, **Mode** = quick settings menu
Enter/ Cal = Double-function key: **Enter** = Confirm function, **Cal** = Immediate calibration access
Up = Increase key
Down = Decrease key

Probe calibration function *(Press the **Cal** key for 3 seconds [press Esc to exit])*

- *Calibrating the pH probe*
    - Immerse the probe in the 7 pH solution and press Enter.
    - Wait 60 seconds for self-calibration. When finished, probe accuracy is shown as a percentage.
    - Immerse the probe in the 4 pH or 9.22 pH solution and press Enter.
    - Wait 60 seconds for self-calibration. When finished, probe accuracy is shown as a percentage.
- *Calibrating the Redox probe*
    - Immerse the probe in the 465 mV solution and press Enter.
    - Wait 60 seconds for self-calibration. When finished, probe accuracy is shown as a percentage.

Mode Function (quick programming menu) *(Press the **Mode** key for 1 second. Select using the up and down keys)*

- Set Point 1   7.4 pH (Press the Enter key and adjust the value using the up and down keys)
- Set Point 2   7.4 pH (Press the Enter key and adjust the value using the up and down keys)
- Relay 1 (Press the Enter key to change the relay's status)
- Relay 2 (Press the Enter key to change the relay's status)

Note: The instrument exits automatically after 10 seconds.

Value settings menu function *(Press the **Enter** and **Esc** keys for 5 seconds)*

- Language (Set menu's language)
    - Available in English (UK), French (FR), Spanish (ES), German (DE), Italian (IT)
- Set Point 1 (Set dosing or control functions via relay 1)
- Set Point 2 (Set dosing or control functions via relay 2)
- Temperature (Menu available only for pH measurement)
- mA output (Set current output)
- Advanced (technical management menu)

Default parameters reset function

- Switch off the instrument.
- Press the **Up** and **Down** keys together and turn on the instrument.
- The instrument displays "init._Default". Select Yes using the Up or Down keys and press Enter.
- The instrument reloads all of the default parameters.

Note: To exit the menus, press **Esc.**

3.3__GENERAL SETTINGS

Press the **Enter and Esc** keys at the same time. Value Programming:

Programming Menu (Default parameters)	
Language	
Language setting	UK
Set Point 1	
Set Point value	7.4 pH
Type of dosing	Acid
Proportional band	0.4 pH
Hysteresis	0.0 pH
ON Timer	OFF
OFF Timer	OFF
Delay Start	OFF
Delay End	OFF
Set Point 2 (Set Point 1 Dosing or Alarm can be selected, see advanced menu)	
Set Point value	7.4 pH
Type of dosing	Acid
Proportional band	0.4 pH
Hysteresis	0.0 pH
ON Timer	OFF
OFF Timer	OFF
Delay Start	OFF
Delay End	OFF
Temperature (*)	
Measurement unit	°C
Manual Value	25 °C
mA Output	
Range 0/4÷20 mA	4÷20 mA
Value for 0 / 4 mA	Value 0 pH
Value for 20 mA	Value 14 pH
Advanced	
Select pH/Redox	pH
Dosing or Alarm Set Point 2	Dosing
Hold input enabled or disabled	Disabled = ON
Calibration enabled or disabled	Enabled = ON
Statistics	
Number of measurement alarms	0
Number of RL1 activations	0
Number of RL2 activations	0
Number of Hold input signals	0
Statistics reset	
Control Panel	
Relay 1 contact normally open or closed	Normally open
Relay 2 contact normally open or closed	Normally open
Manual current output	0÷20 mA current generator
mV input probe signal	Displays signal in mV
Hold signal present	Signal present, ON; missing, OFF
Temperature probe calibration (**)	Set offset value
Offset calibration	Offset in %, last calibration
Gain calibration (*)	Gain in %, last calibration
Firmware version	X.X
Instrument reset	Restore default values
Password	0000

*menu present only with pH measurement

** menu present only with temperature probe installed

3.3__Programming menu detailed settings

Press the Enter and Esc keys together for 5 seconds to access the instrument's programming menu.

Language menu: Set the desired language from the following:
Italian
English
French
Spanish
German

Set Point 1 menu: Set the dosing parameters; all settings will be activated by Relay 1.
The menu contains the following items:

Item	Default	Limits
Set Point value	7.4 pH / 750 mV	0÷14 pH / ±1500 mV
Type of dosing	Acid / Low	Acid or Alkaline/High or Low
Proportional band	0.4 pH / 40 mV	0.4÷3 pH / 40÷300 mV
Hysteresis	0.0 pH / 0 mV	0÷3 pH / 0÷300 mV
ON Timer	OFF	OFF…1÷480 minutes
OFF Timer	OFF	OFF…1÷480 minutes
Delay Start	OFF	OFF…3÷960 seconds
Delay End	OFF	OFF…3÷960 seconds

Set Point 2 menu: Set the dosing parameters; all settings will be activated by Relay 2.
The menu contains the same items as Set Point 1 if **SET POINT 2 = Dosing** (see Advanced menu, page 8).

If **SET POINT 2 = ALARM** (see Advanced menu, page 8), Relay 2 can be used as a measurement alarm for Set Point 1. The menu therefore changes as follows:

Item	Default	Limits
Set Point 1 alarm band	3 pH / 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (Set Point 1 over feed alarm)	OFF	OFF÷960 minutes

Temperature menu: Set the temperature for automatic compensation of the pH measurement. The measurement unit may also be set.

Item	Default	Limits
Measurement unit	°C	°C; °F
Manual Value	25 °C	0÷100 °C; 32÷212 °F

Current output: Set the current output scale and values.

Item	Default	Limits
Scale: 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Value: 0/4 mA (*)	0 pH / -1500 mV	0÷14 pH / ±1500 mV
Value: 20 mA (*)	14 pH / 1500 mV	0÷14 pH / ±1500 mV

(* For ramp inversion, the scale's opposite value can be set: 20 ÷ 4/0 mV)

Advanced menu: The following items can be used to modify the instrument's functions and to control each function. This menu is for specialized technical personnel only.

Item	Default	Limits
Select pH/Redox	pH	pH; Redox
Dosing or Alarm Set Point 2	Dosing	SP1 Dosing or Alarm
Hold input enabled or disabled	ON	OFF= Disabled; ON= Enabled
Calibration enabled or disabled	ON	OFF= Disabled; ON= Enabled

The instrument's number of activations or variations can be verified using the *Statistics* menu.

Statistics		
	Number of measurement alarms	0
	Number of RL1 activations	0
	Number of RL2 activations	0
	Number of Hold input signals	0
	Statistics reset	

To facilitate the installer during system testing, each input and output on the instrument panel can be manually set and verified using the following *Control Panel* menu.

Control Panel		
	Relay 1 contact normally open or closed	Normally open
	Relay 2 contact normally open or closed	Normally open
	Manual current output	0÷20 mA current generator
	mV input probe signal	Displays the probe signal in mV
	Hold signal present	Signal present ON; missing OFF
	Temperature probe calibration (**)	Set offset value
	Calibration offset Value	Offset in %, last calibration
	Gain calibration (*)	Gain in %, last calibration
	Firmware version	X.X

*menu present only with pH measurement
** menu present only with temperature probe installed

Note: The instrument does not automatically exit from the *Control Panel* menu so that the installer may work manually. Press the ESC key to exit.

All of the default parameters can be reset with the *Instrument Reset* menu. It automatically exits the Settings menu. The default parameters are shown on page 6.

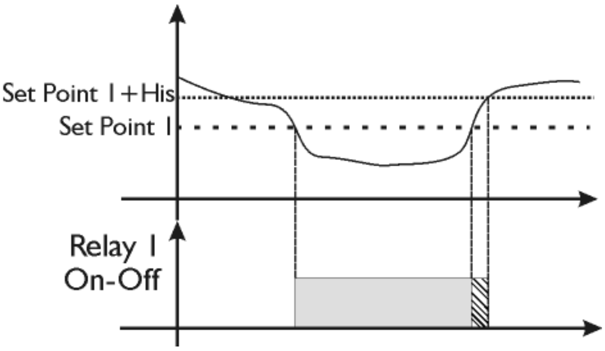
Instrument Reset	Restore default values

The Settings menu can be protected from unauthorized personnel by means of the *Password* menu. The standard password is 0000. If the programmed password is lost or forgotten, access the hidden menu shown on page 5 to reset the factory defaults.

Password	0000

3.4__Dosing and adjustment examples

Dosing Operation/Pause (ON-OFF)

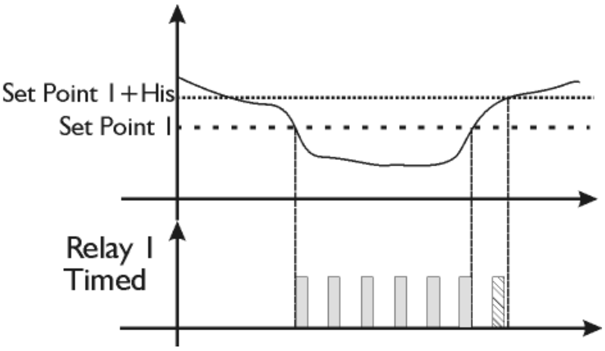


The instrument permits automatic control and modification of the chemical measurement through Set Point 1, adjusting dosing by means of On-Off Relay 1.
The dosing example on the side can be set using the following parameters:

- Set Point 1 = 7.20 pH
- Type of Dosing = Alkaline
- Proportional Band = OFF
- Hysteresis = 0.40
- ON Timer = OFF
- OFF Timer = OFF

The instrument will begin dosing for values below 7.20 and will stop dosing when above 7.60. If Acid is set for Type of Dosing, dosing will be the exact opposite: dosing will begin above 7.20 and will stop below 6.80 pH. The instrument permits two independent dosings by setting Set Point 2 associated with Relay 2.

Timed Dosing

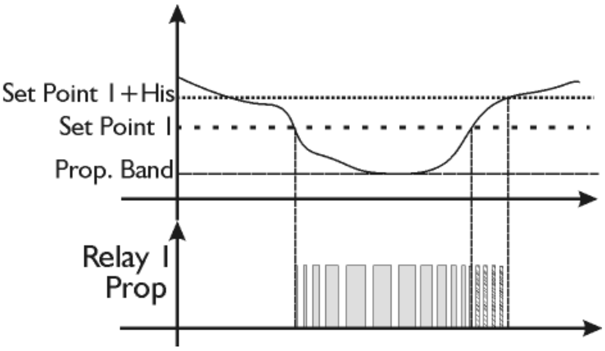


The instrument permits automatic control and modification of the chemical measurement through Set Point 1, adjusting dosing by means of Timed Relay 1.
The dosing example on the side can be set using the following parameters:

- Set Point 1 = 7.20 pH
- Type of Dosing = Alkaline
- Proportional Band = OFF
- Hysteresis = 0.40
- ON Timer = 5 minutes
- OFF Timer = 10 minutes

The instrument will begin timed dosing for values below 7.20 and will stop dosing when above 7.60. If Acid is set for Type of Dosing, dosing will be the exact opposite: dosing will begin above 7.20 and will stop below 6.80 pH. The instrument permits two independent dosings by setting Set Point 2 associated with Relay 2.

Proportional Dosing (Prop)



The instrument permits automatic control and modification of the chemical measurement through Set Point 1, adjusting dosing by means of Proportional Relay 1.
The dosing example on the side can be set using the following parameters:

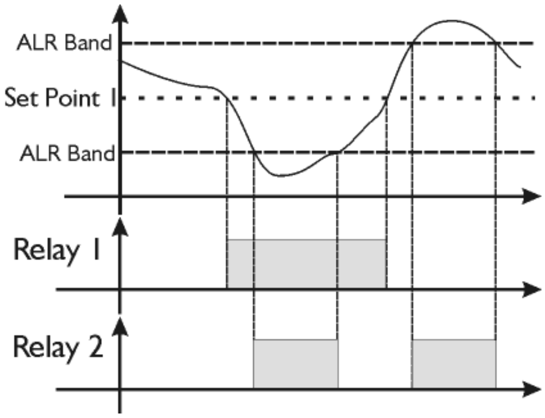
- Set Point 1 = 7.20 pH
- Type of Dosing = Alkaline
- Proportional Band = 0.40 pH
- Hysteresis = 0.40
- ON Timer = 10 minutes (*)
- OFF Timer = 10 minutes (*)

The instrument will begin proportional dosing for values below 7.20 and will stop dosing when above 7.60. If Acid is set for Type of Dosing, dosing will be the exact opposite: dosing will begin above 7.20 and will stop below 6.80 pH. The instrument permits two independent dosings by setting Set Point 2 associated with Relay 2.

(* when equal times are set for *ON Timer and OFF Timer*, the instrument calculates a total period that it automatically modifies in relation to the chemical measurement's variation. In the hysteresis band, it doses at the minimum value)

Note: All of the adjustment and dosing settings also apply to Redox measurement.

Relay 2 used as alarm for Set Point 1



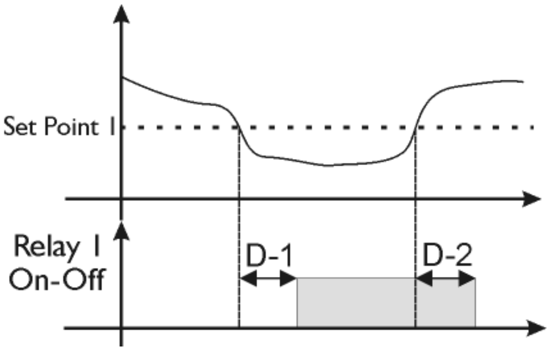
When the Alarm Band is set, an operation window is created. When these limits are surpassed, Relay 2 closes and remains closed until the measurement is reset or the Enter key is pressed to deactivate the alarm.

When the OFA time (Over Feed Alarm) is set, the dosing time of Set Point 1 is controlled with two alarms:

- First alarm: 70% of the programmed time is shown on the display and Relay 2 closes.
- Second alarm: 100% of the programmed time is shown on the display and Relay 2 closes.

Eliminate the alarm by pressing the Enter key.
Note: The RL2 icon is transformed into RLA.

Dosing with delays



The instrument permits dosing start and end delays. The dosing example on the side can be set using the following parameters:

- Delay Start (D-1) = 5 minutes
- Delay End (D-2) = 5 minutes

This function is available for all of the previously described settings: ON-OFF, Timed, Prop.

Note: The variables shown above are independently available for Set Point 1 and Set Point 2.

4 TROUBLESHOOTING

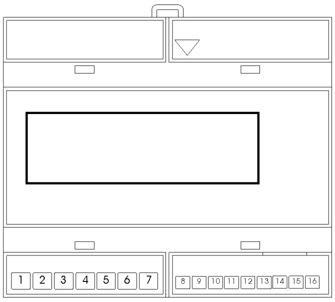
- **The device does not come on…**
  - Make sure that the power cables are correctly connected
  - Check whether the power supply is present
- **The display does not light up…**
  - Regulate the display contrast
- **The chemical measurement function does not work…**
  - Check the probe connection
  - Calibrate as instructed in the manual
  - Replace the probe
- **The mA output does not change…**
  - Check the cable connection
  - Use the “Manual Control” function in the main menu to check whether the output produces the desired effect.
  - Check the electrical characteristics of the remote device (maximum load: 500 ohm).
- **The relays do not work…**
  - Check whether the instrument is correctly powered
  - Check the settings in the main menu
- **The VDC port voltage does not stop the instrument…**
  - Check the electrical connections
  - Check whether the remote generator is working.

Note: If the anomaly persists, please contact the supplier.

4.1 Alarm table:

Alarm	Display	Relay status	Solutions	Priority
Hold	Hold ALR	RL1 and RL2 disabled	Eliminate signal on Hold voltage input	1
OFA pre-alarm Time > 70%	OFA ALR	RL2 Closed	- Press Enter to eliminate the alarm. - Check the system.	2
OFA Alarm Time = 100%	OFA Stop	RL2 Closed	- Press Enter to eliminate the alarm. - Check the system.	3
Measurement alarm band	Band ALR	RL2 Closed	- Press Enter to silence Relay 2. - Check the system.	4

pH/Redox-Messgerät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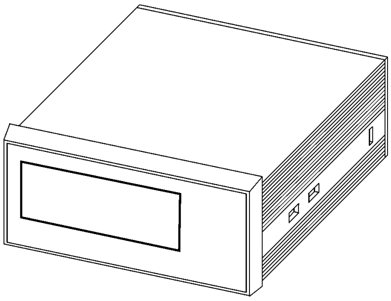
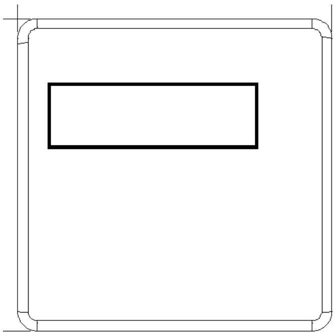
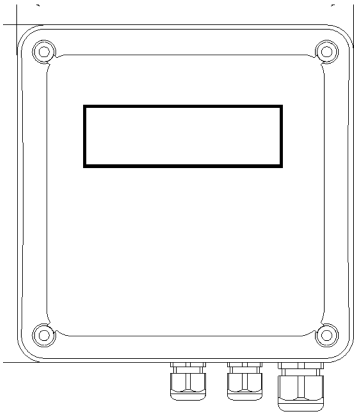






INHALTSVERZEICHNIS

1 Vorbemerkungen Seite 2
2 Installation Seite 3
3 Einstellungen und Funktionsweise Seite 5
4 Leitfaden zur Problemlösung Seite 11

1 VORBEMERKUNGEN

1.1 WILLKOMMEN

➲ Bitte lesen Sie das vorliegende Handbuch aufmerksam durch und beachten Sie vor allem die Hinweise und Vorsichtsmaßnahmen. Halten Sie stets die erforderlichen Sicherheitsverfahren ein und benutzen Sie einen zweckmäßigen Augen- und Gesichtsschutz sowie Schutzkleidung.

1.2 1.2 VERPACKUNGSINHALT

- Messgerät
- Montagehalterungen
- Handbuch

1.3 TECHNISCHE EIGENSCHAFTEN

Chemischer Messbereich: 0÷14.0 pH bzw. ±1500 mV für Redox
Messgenauigkeit: 1% FS pH bzw. 1% FS Redox

Eingangsimpedanz chemische Messung: 1 x 10^{13} Ohm
Anschluss der Sonde für die chemische Messung: BNC.
Kalibrierung der Sonden: über Software

Temperaturmessbereich: zwischen 0 und +100 °C (Auflösung 1 °C)
Automatischer Temperaturausgleich zwischen 0 und 100 °C über den Sensor PT100 oder manuelle Eingabe am Gerät.

Relaisausgang: Nummer 2 Setpoint (max. ohmsche Belastung 10 A 250 Vac)

Stromausgänge: Nummer 1 (max. Belastung 500 Ohm) [Messgenauigkeit ±2% F.S.]

Eingang: 15÷30 Vac/dc

Stromversorgung: 90÷265 Vac 50/60 Hz
Stromaufnahme: max. 5 VA
Sicherung: 500 mA (träge)

Display: LCD 2 Zeilen 16 Zeichen
Tastatur: 4 Tasten

Mechanische Abmessungen: DIN-Schienen Schalttafel; 48x96x98 mm Schalttafel, 96x96 Schalttafel, 144x144 Wand.
Schutzgrad:

- Din-Rail = IP40
- 48x96 = IP40
- 96x96 = IP65 Frontabdeckung
- 144x144 = IP65 voller Kasten

1.4 HINWEISE

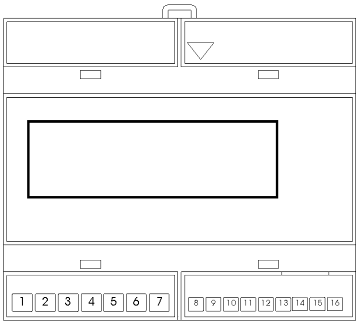
✋ Lesen Sie dieses Handbuch aufmerksam durch, bevor Sie das System installieren und in Betrieb nehmen.
✋ Das Dosieraggregat muss so an der Versorgungsspannung angeschlossen werden. dass eine allpolige Trennvorrichtung mit mindestens 3 mm Kontaktabstand vorgeschaltet ist.
✋Überprüfen Sie, welches Gerätemodell Sie erworben haben, um sich hinsichtlich Installation, Einstellungen und Programmierung auf die entsprechenden Bereiche diese Handbuchs beziehen zu können.
✋Für alle Anschlüsse beziehen Sie sich bitte auf die Zeichnung der Steuerschaltung im vorliegenden Handbuch.
☠ ACHTUNG: Halten Sie stets die erforderlichen Sicherheitsverfahren ein und benutzen Sie einen zweckmäßigen Augen- und Gesichtsschutz sowie Schutzkleidung.
☠ ACHTUNG: Unterbrechen Sie während der Installation oder Wartung dieses Gerätes immer die Stromversorgung.
➲ Das Unternehmen arbeitet stets an der Verbesserung der Produkte und behält sich das Recht vor, jederzeit und ohne vorherige Ankündigung Änderungen vorzunehmen.
➲ Die Nichtbeachtung der in diesem Handbuch enthaltenen Normen kann zu Sach- oder Personenschäden führen, den Betrieb beeinträchtigen oder das Gerät beschädigen.

1.5 NOTWENDIGES INSTALLATIONSMATERIAL

Halten Sie das nötige Werkzeug für die Befestigung des Geräts bereit.

2 Mechanische und elektrische INSTALLATION

2.1.___DIN-Schienenausführung (6 Module DIN EN50022)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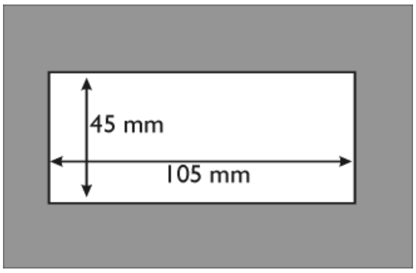
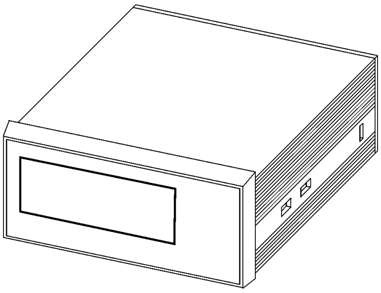
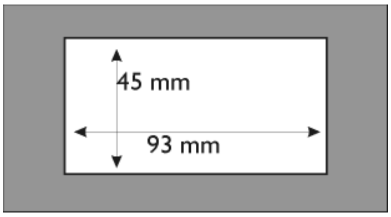
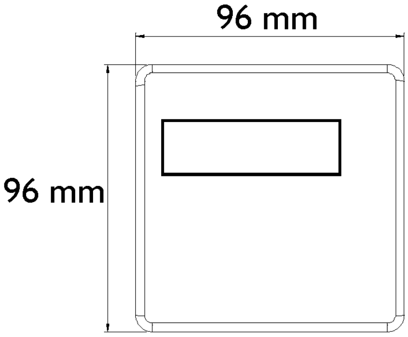


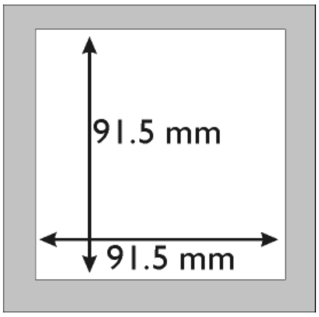
2.2___Ausführung 48x96x100



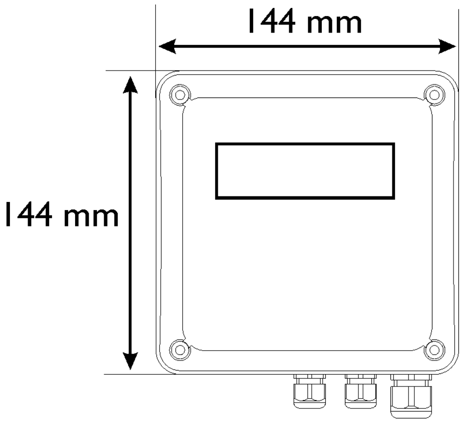


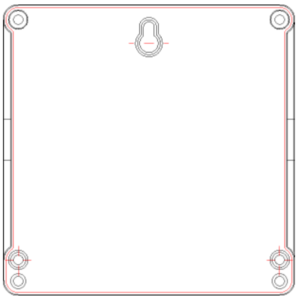
2.3___Ausführung 96x96x92

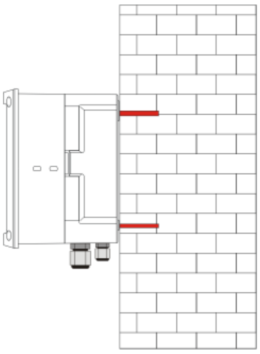



91.5 mm
91.5 mm

2.4__Ausführung 144x144x90


144 mm
144 mm



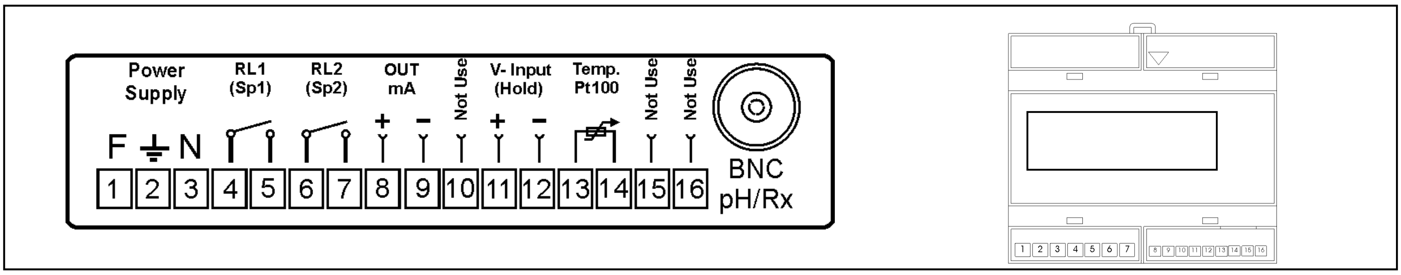


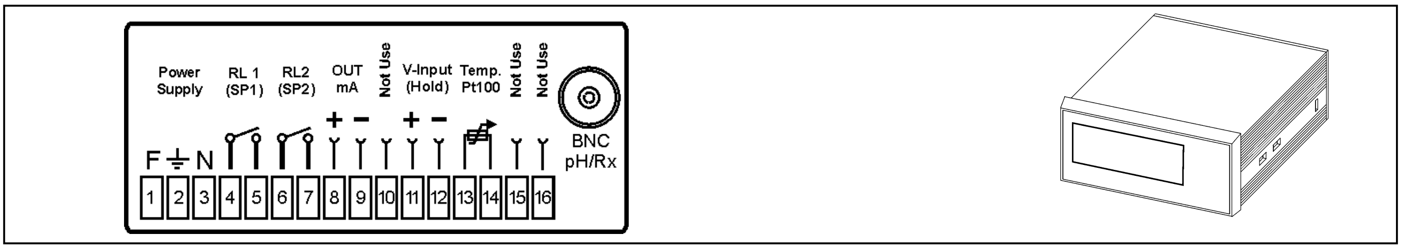
2.5 Beschreibung der elektrischen Anschlüsse

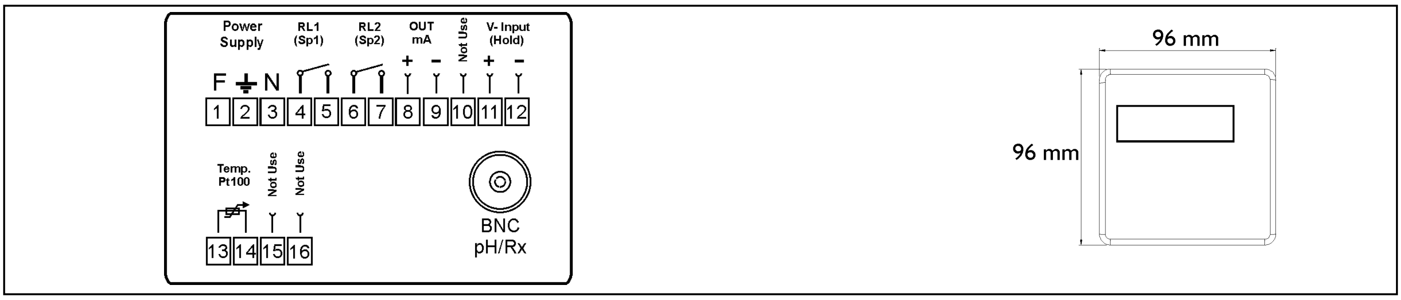
2.5.1__Tabelle der elektrischen Anschlüsse

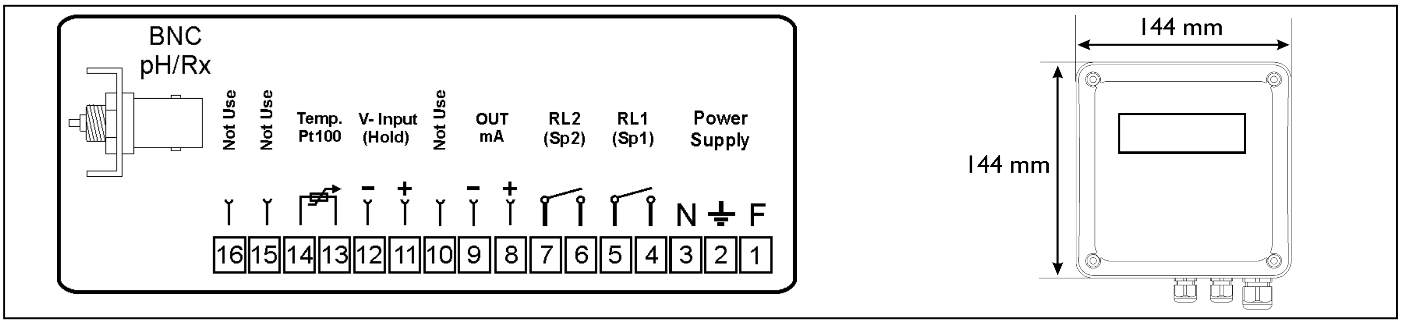
Klemme	Beschreibung
1	Phase (Stromversorgung 230 Vac)
2	Erde
3	Nullleiter (Stromversorgung 230 Vac)
4-5	Relais Setpoint 1
6-7	Relais Setpoint 2
8-9	Stromausgang 0/4÷20 mA
10	Nicht verwendet
11-12	VDC Eingang 15÷30 Vdc **Hold**
13-14	Eingang Temperatursonde
15-16	Nicht verwendet
BNC	Eingang pH/Redox-Sonde

2.5.2__Schild der elektrischen Anschlüsse für alle Modelle


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx


Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx
96 mm
96 mm

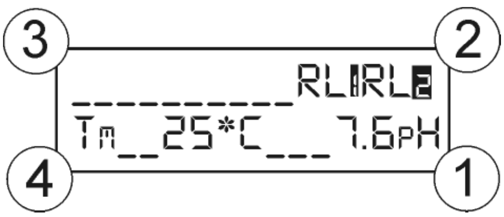

BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
144 mm
144 mm

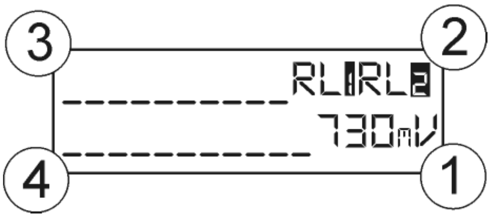
2.6 HYDRAULISCHE ANSCHLÜSSE

Keine

3.0___EINSTELLUNGEN UND BETRIEB

3.1__Geräteanzeige





Bereich 1 = Anzeige der chemischen pH- bzw. Redoxmessung
Bereich 2 = Anzeige des Zustands von Relais 1 und 2. Wenn die Nummer des Relais blinkt, hat der Kontakt seinen Zustand geändert
Bereich 3 = Anzeige der Alarme
Bereich 4 = Anzeige der manuellen oder automatischen Temperatur für die pH-Messung; bei der Redox-Ausführung leerer Bereich
Hinweise: Das Symbol RL2 wird zu RLA, wenn der Setpoint 2 mit Alarmfunktion eingegeben wird.

3.2__Gerätetastatur

Esc/Mode = Taste mit Doppelfunktion **Esc** = Sofortiges Verlassen des Menüs **Mode**= Schnelleinstellungsmenü
Enter/Kal = Taste mit Doppelfunktion **Enter** = Bestätigen einer Funktion **Kal** = Sofortzugriff auf die Kalibrierung
Auf = Erhöhungstaste
Ab = Verringerungstaste

Funktion zur Kalibrierung der Sonde *(Die Taste **KAL** 3 Sekunden lang drücken [zum Verlassen der Funktion Esc drücken])*

- *Kalibrierung der pH-Sonde*
    - Die Sonde in die 7 pH-Lösung tauchen und Enter drücken
    - 60 Sekunden zur Selbstkalibrierung warten. Am Ende wird die Qualität der Sonde in Prozentgrad angezeigt.
    - Die Sonde in die 4 pH- oder die 9.22 pH-Lösung tauchen und Enter drücken
    - 60 Sekunden zur Selbstkalibrierung warten. Am Ende wird die Qualität der Sonde in Prozentgrad angezeigt.
- *Kalibrierung der Redox-Sonde*
    - Die Sonde in die 465 mV-Lösung tauchen und Enter drücken
    - 60 Sekunden zur Selbstkalibrierung warten. Am Ende wird die Qualität der Sonde in Prozentgrad angezeigt.

Funktion Mode (Schnellmenü) *(Die Taste **Mode** 1 Sekunde lang drücken und über die Tasten Auf und Ab auswählen)*

- Setpoint 1 7,4 pH (Die Taste Enter drücken und den Wert über die Tasten Auf und Ab einstellen)
- Setpoint 2 7,4 pH (Die Taste Enter drücken und den Wert über die Tasten Auf und Ab einstellen)
- Relais 1 (Die Taste Enter drücken, um den Zustand des Relais zu ändern)
- Relais 2 (Die Taste Enter drücken, um den Zustand des Relais zu ändern)

Hinweis: Nach 10 Sekunden verlässt das Gerät die Funktion automatisch

Funktion Eingabemenü *(Die Tasten **Enter** und **Esc** 5 Sekunden lang drücken)*

- Sprache (Die Menüanzeigesprache eingeben)
    - Zur Verfügung stehen Englisch (UK), Französisch (FR), Spanisch (ES), Deutsch (DE), Italienisch (IT)
- Setpoint 1 (Die Dosier- bzw. Kontrollfunktionen über das Relais 1 einstellen)
- Setpoint 2 (Die Dosier- bzw. Kontrollfunktionen über das Relais 2 einstellen)
- Temperatur (Menü nur für pH-Messung verfügbar)
- Output mA (Stromausgang einstellen)
- Erweitert (Technisches Verwaltungsmenü)

Funktion zum Wiederherstellen der Werksparameter

- Das Gerät ausschalten
- Zusammen die Tasten **Auf** und **Ab** drücken und das Gerät einschalten
- Das Gerät zeigt init._Default an. Über die Tasten Auf bzw. Ab Yes auswählen und Enter drücken
- Das Gerät stellt alle Werksparameter wieder her

Hinweis: Zum Verlassen des Menüs **Esc** drücken

3.3__ALLGEMEINE EINSTELLUNGEN

Gleichzeitiges Drücken der Tasten **Enter** und **Esc** zur Programmierung der Werte:

Programmiermenü (Werksparameter)	
Sprache	
Sprachauswahl	UK
Setpoint 1	
Setpoint-Wert	7,4 pH
Dosierarten	Säure
Proportionalband	0,4 pH
Hysterese	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Setpoint 2 (Dosierung oder Alarm Setpoint 1 sind wählbar, siehe Erweitertes Menü)	
Setpoint-Wert	7,4 pH
Dosierarten	Säure
Proportionalband	0,4 pH
Hysterese	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Temperatur (*)	
Messeinheit	°C
Manueller Wert	25 °C
Output mA	
Messbereich 0/4÷20 mA	4÷20 mA
Wert für 0 / 4 mA	Wert 0 pH
Wert für 20 mA	Wert 14 pH
Erweitert	
Auswahl pH/Redox-Messung	pH
Setpoint 2 Dosierung oder Alarm	Dosierung
Hold-Eingang aktiviert oder deaktiviert	Deaktiviert = ON
Kalibrierung aktiviert oder deaktiviert	Aktiviert = ON
Statistiken	
Anzahl Messalarme	0
Anzahl Aktivierungen RL1	0
Anzahl Aktivierungen RL2	0
Anzahl Signale Hold-Eingang	0
Reset Statistiken	
Steuertafel	
Kontakt Relais 1 normalerweise offen oder geschlossen	Normalerweise offen
Kontakt Relais 2 normalerweise offen oder geschlossen	Normalerweise offen
Stromausgang, manueller Wert	Stromgenerator 0÷20 mA
Eingangssignal Sonde in mV	Zeigt das Signal in mV an
Hold-Signal vorhanden	Signal vorhanden ON; nicht vorhanden OFF
Kalibrierung Temperatursonde (**)	Korrekturwert eingeben
Offset-Wert Kalibrierung	Offset in % letzte Kalibrierung
Gain-Wert Kalibrierung (*)	Gain in % letzte Kalibrierung
Revision Firmware	X.X
Reset des Geräts	Werkseinstellungen wiederherstellen
Passwort	0000

*Menü nur mit pH-Messung vorhanden

** Menü nur mit installierter Temperatursonde vorhanden

3.3__Detaillierte Einstellungen Programmiermenü

Zusammen 5 Sekunden lang die Tasten Enter und Esc drücken. Auf diese Weise wird das Programmiermenü des Geräts ausgeführt.

Menüsprache: Die gewünschte Sprache einstellen. Es bestehen folgende Auswahlmöglichkeiten:
Italienisch
Englisch
Französisch
Spanisch
Deutsch

Setpoint 1 Menü: Die Dosierparameter eingeben. Alle Einstellungen werden vom Relais 1 aktiviert.
Das Menü besteht aus folgenden Punkten

Menüpunkt	Default	Grenzen
Setpoint-Wert	7,4 pH /750 mV	0÷14 pH / ±1500 mV
Dosierarten	Säure / Niedrig	Säure oder Alkali-Lösung /Hoch oder Niedrig
Proportionalband	0,4 pH /40 mV	0,4÷3 pH / 40÷300 mV
Hysterese	0,0 pH / 0 mV	0÷3 pH / 0÷300 mV
Timer ON	OFF	OFF…1÷480 Minuten
Timer OFF	OFF	OFF…1÷480 Minuten
Delay Start	OFF	OFF…3÷960 Sekunden
Delay End	OFF	OFF…3÷960 Sekunden

Setpoint 2 Menü: Die Dosierparameter eingeben. Alle Einstellungen werden vom Relais 2 aktiviert.
Das Menü besteht aus den gleichen Menüpunkten wie Setpoint 1, wenn es mit der Funktion **SETPOINT 2= Dosierung** verwendet wird (siehe Erweitertes Menü auf S. 8).

Wenn die Funktion **SETPOINT 2= ALARM** eingegeben wird (siehe Erweitertes Menü auf S. 8), kann das Relais 2 als mit dem Setpoint 1 verbundener Messalarm verwendet werden. Demzufolge verändert sich das Menü wie folgt:

Menüpunkt	Default	Grenzen
Alarmbereich Setpoint 1	3 pH / 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (Over Feed Alarm Setpoint 1)	OFF	OFF÷960 minutes

Menütemperatur: Den Temperaturwert für die automatische Kompensierung der pH-Messung eingeben. Es kann auch die Messeinheit eingestellt werden.

Menüpunkt	Default	Grenzen
Messeinheit	°C	°C; °F
Manueller Wert	25 °C	0÷100 °C; 32÷212 °F

Stromausgang: Die Skala und die Werte des Stromausgangs einstellen

Menüpunkt	Default	Grenzen
Skala 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Wert 0/4 mA (*)	0 pH / -1500 mV	0÷14 pH / ±1500 mV
Wert 20 mA (*)	14 pH / +1500 mV	0÷14 pH / ±1500 mV

(* In die angegebenen Menüpunkte kann der gegengesetzte Wert der Skala eingegeben werden. Auf diese Weise lässt sich die Rampeninversion 20 ÷ 4/0 mV erzielen)

Erweitertes Menü: Über die nachstehenden Menüpunkte lassen sich die Gerätefunktionen verändern und jede Funktion kann gesteuert werden; dieses Menü ist spezialisiertem Fachpersonal vorbehalten.

Menüpunkt	Default	Grenzen
Auswahl ph/Redox-Messung	pH	pH; Redox
Setpoint 2 Dosierung oder Alarm	Dosierung	Dosierung oder Alarm SP1
Hold-Eingang aktiviert oder deaktiviert	ON	OFF= Deaktiviert; ON= Aktiviert
Kalibrierung aktiviert oder deaktiviert	ON	OFF= Deaktiviert; ON= Aktiviert

Mit dem nachstehenden Menü *Statistiken* lässt sich überprüfen, wie viele Aktivierungen oder Veränderungen am Gerät vorgenommen worden sind.

Statistiken	
Anzahl Messalarme	0
Anzahl Aktivierungen RL1	0
Anzahl Aktivierungen RL2	0
Anzahl Signale Hold-Eingang	0
Reset Statistiken	

Mit dem nachstehenden Menü *Steuertafel* lassen sich alle im Gerät vorhandenen Eingangs- und Ausgangsaktionen manuell einstellen und überprüfen, um die Installation während der Anlagenabnahme zu erleichtern.

Steuertafel	
Kontakt Relais 1 Normalerweise offen oder geschlossen	Normalerweise offen
Kontakt Relais 2 Normalerweise offen oder geschlossen	Normalerweise offen
Stromausgang, manueller Wert	Stromgenerator 0÷20 mA
Eingangssignal Sonde in mV	Zeigt das Signal der Sonde in mV an
Hold-Signal vorhanden	Signal vorhanden ON; nicht vorhanden OFF
Kalibrierung Temperatursonde (**)	Korrekturwert eingeben
Offset-Wert Kalibrierung	Offset in % letzte Kalibrierung
Gain-Wert Kalibrierung (*)	Gain in % letzte Kalibrierung
Revision Firmware	X.X

*Menü nur mit pH-Messung vorhanden

** Menü nur mit installierter Temperatursonde vorhanden

Hinweis: Im Menü *Steuertafel* verlässt das Gerät die Funktion nicht automatisch, um dem Monteur zu ermöglichen, manuell zu arbeiten. Zum Verlassen der Funktion die Taste ESC drücken.

Mit dem nachstehenden Menü *Reset des Geräts* können alle Werksparameter wiederhergestellt werden, das Eingabemenü wird automatisch verlassen. Die Werksparameter sind auf Seite 6 aufgeführt

Reset des Geräts	Stellt die Werksparameter wieder her

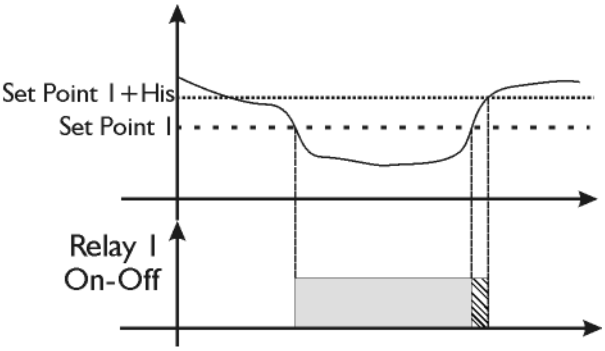
Mit dem nachstehenden Menü *Password* kann das Eingabemenü vor Zugriff durch unbefugtes Personal geschützt werden. Der Standartwert ist 0000. Wenn das eingegebene Passwort verloren gegangen ist oder vergessen wurde, das versteckte Menü von Seite 5 ausführen, um die Defaultwerte wiederherzustellen.

Passwort	0000

3.4__Beispiele für Dosierung und Einstellung

Dosierung Unterbrechung/Betrieb (ON-OFF)

Das Gerät ermöglicht eine automatische Kontrolle und Veränderung der chemischen Messung über den Setpoint 1, indem die Dosierung über das Relais 1 eingestellt wird, das sich auf Unterbrechung/Betrieb einstellen lässt.



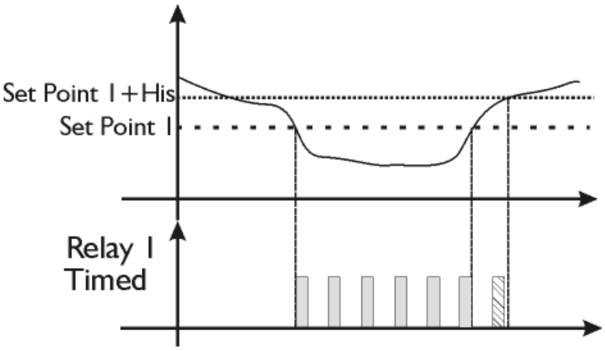
Durch Einstellen der folgenden Parameter erhält man die an der Seite aufgeführte Dosierung:

- Setpoint 1 = 7,20 pH
- Dosierart = Alkali-Lösung
- Proportionalband = OFF
- Hysterese = 0.40
- Timer On = OFF
- Timer OFF = OFF

Das Gerät beginnt die Dosierung bei Werten unter 7,20 und endet die Dosierung bei Werten über 7,60; durch Verändern des Menüpunkts Dosierart in Säure erfolgt die Dosierung genau umgekehrt, sie beginnt bei Werten über 7,20 und endet bei Werten unter 6,80 pH. Das Gerät ermöglicht die Durchführung von zwei unabhängigen Dosierungen, indem der Setpoint 2 eingegeben wird, der dem Relais 2 entspricht.

Getaktete Dosierung (Timed)

Das Gerät ermöglicht eine automatische Kontrolle und Veränderung der chemischen Messung über den Setpoint 1, indem die Dosierung über das Relais 1 eingestellt wird, das sich auf feste Zeiten einstellen lässt.



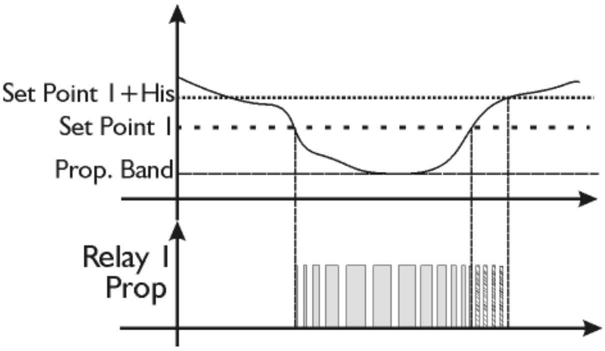
Durch Einstellen der folgenden Parameter erhält man die an der Seite aufgeführte Dosierung:

- Setpoint 1 = 7,20 pH
- Dosierart = Alkali-Lösung
- Proportionalband = OFF
- Hysterese = 0.40
- Timer On = 5 Minuten
- Timer OFF = 10 Minuten

Das Gerät beginnt die getaktete Dosierung bei Werten unter 7,20 und endet die Dosierung bei Werten über 7,60; durch Verändern des Menüpunkts Dosierart in Säure erfolgt die Dosierung genau umgekehrt, sie beginnt bei Werten über 7,20 und endet bei Werten unter 6,80 pH. Das Gerät ermöglicht die Durchführung von zwei unabhängigen Dosierungen, indem der Setpoint 2 eingegeben wird, der dem Relais 2 entspricht.

Proportionale Dosierung (Prop)

Das Gerät ermöglicht eine automatische Kontrolle und Veränderung der chemischen Messung über den Setpoint 1, indem die Dosierung über das Relais 1 eingestellt wird, das sich auf eine proportionale Zeit einstellen lässt.



Durch Einstellen der folgenden Parameter erhält man die an der Seite aufgeführte Dosierung:

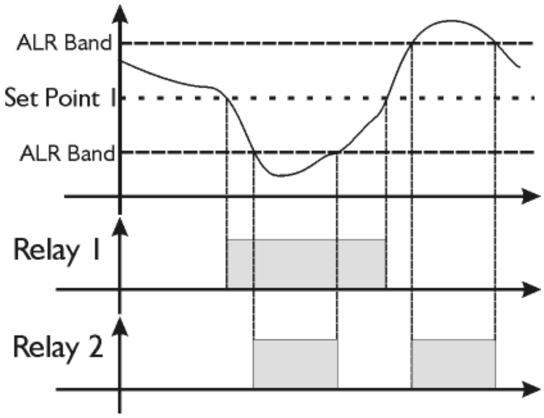
- Setpoint 1 = 7,20 pH
- Dosierart = Alkali-Lösung
- Proportionalband = 0,40 pH
- Hysterese = 0.40
- Timer On = 10 Minuten (*)
- Timer OFF = 10 Minuten (*)

Das Gerät beginnt die proportionale Dosierung bei Werten unter 7,20 und endet die Dosierung bei Werten über 7,60; durch Verändern des Menüpunkts Dosierart in Säure erfolgt die Dosierung genau umgekehrt, sie beginnt bei Werten über 7,20 und endet bei Werten unter 6,80 pH. Das Gerät ermöglicht die Durchführung von zwei unabhängigen Dosierungen, indem der Setpoint 2 eingegeben wird, der dem Relais 2 entspricht.

(* Bei Eingabe von gleichen Zeiten in die Variablen *Timer ON und OFF* berechnet das Gerät einen Gesamtzeitraum, der in Bezug auf die Veränderung der chemischen Messung im Hystereseband automatisch verändert; es wird beim Mindestwert dosiert)

Hinweis: Alle Eingaben bzgl. Einstellung und Dosierung gelten auch für die Redox-Messung.

Als Alarm für Setpoint 1 verwendetes Relais 2



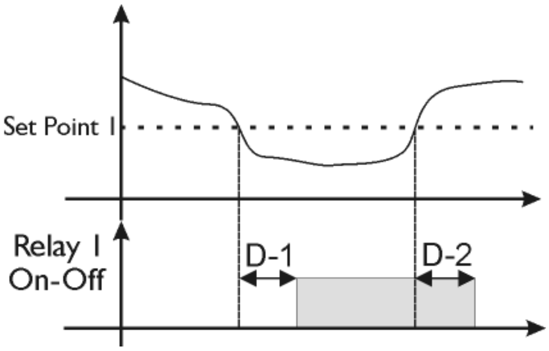
Durch Einstellen des Alarmbands wird ein Arbeitsfenster erstellt, wobei sich bei Überschreitung der zulässigen Grenzen das Relais 2 schließt und so lange geschlossen bleibt, bis der Messwert wiederhergestellt bzw. die Taste Enter zu Deaktivierung des Alarms gedrückt wird.

Durch Einstellen der OFA-Zeit (Over Feed Alarm) wird die Dosierung von Setpoint 1 zeitlich gesteuert. In zwei Alarme untergliedert:

- Der erste Alarm wird bei 70% der eingegebenen Zeit auf dem Display angezeigt und das Relais 2 schließt sich.
- Der zweite Alarm wird bei 100% der eingegebenen Zeit auf dem Display angezeigt und das Relais 2 schließt sich.

Die Taste Enter drücken, um den Alarm zu beseitigen. **Hinweis:** Das Symbol RL2 wird zu RLA

Dosierung mit Verzögerungszeiten



Das Gerät ermöglicht eine zeitliche Verzögerung von Beginn und Ende der Dosierung. Durch Einstellen der folgenden Parameter erhält man die an der Seite aufgeführte Dosierung:

- Delay Start (D-1) = 5 Minuten
- Delay End (D-2) = 5 Minuten

Diese Funktion steht bei allen zuvor beschriebenen Einstellungen zur Verfügung (ON-OFF, Timed, Prop).

Hinweis: Die oben aufgeführten Variablen sind sowohl am Setpoint 1, als auch am Setpoint 2 vorhanden, und zwar unabhängig voneinander.

4 LEITFADEN ZUR PROBLEMLÖSUNG

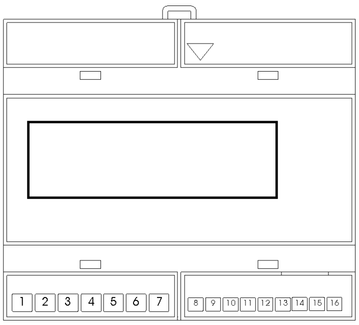
- **Das Gerät schaltet sich nicht ein…**
  - Überprüfen, ob die Versorgungskabel richtig angeschlossen wurden
  - Überprüfen, ob die Netzversorgung vorhanden ist
- **Das Display ist nicht beleuchtet…**
  - Den Kontrast der Displaybeleuchtung einstellen
- **Die chemische Messung funktioniert nicht…**
  - Den Anschluss der Sonde überprüfen
  - Die Kalibrierung, wie im Handbuch beschrieben, durchführen
  - Die Sonde austauschen
- **Der mA-Ausgang verändert sich nicht…**
  - Den Anschluss der Kabel überprüfen
  - Über das Hauptmenü “Manuelle Steuerung” überprüfen, ob der Ausgang die gewünschte Wirkung erzeugt
  - Die elektrischen Eigenschaften des Geräts überprüfen (max. Belastung 500 Ohm)
- **Die Relais funktionieren nicht…**
  - Überprüfen, ob das Gerät richtig versorgt ist
  - Die Einstellungen im Hauptmenü überprüfen
- **Die Spannung am Port Vdc In blockiert das Gerät nicht…**
  - Die elektrischen Anschlüsse überprüfen
  - Überprüfen, ob der Generator funktioniert

Hinweis: Bei fortdauernder Störung kontaktieren Sie den Lieferanten.

4.1 Tabelle der Alarmanzeigen:

Alarm	Anzeige	Relaiszustand	Was ist zu tun	Prioritäten
Hold	ALR Hold	RL1 und RL2 deaktiviert	Signal am Spannungseingang Hold beseitigen	1
OFA-Voralarm > 70%	OFA ALR	RL2 geschlossen	- Die Taste Enter drücken, um den Alarm zu beseitigen - Anlage überprüfen	2
OFA-Alarm =100%	OFA Stop	RL2 geschlossen	- Die Taste Enter drücken, um den Alarm zu beseitigen - Anlage überprüfen	3
Alarmband Messung	ALR Band	RL2 geschlossen	- Die Taste Enter drücken, um das Relais 2 stummzuschalten - Anlage überprüfen	4

Instrumento para la medida del pH o del Redox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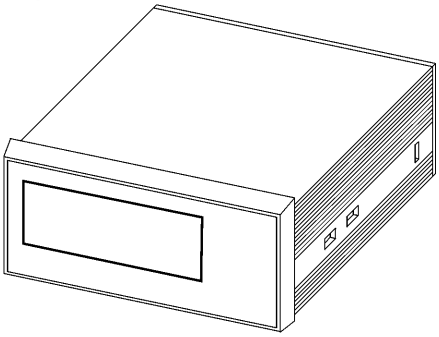
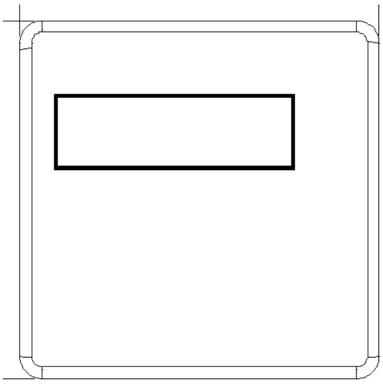
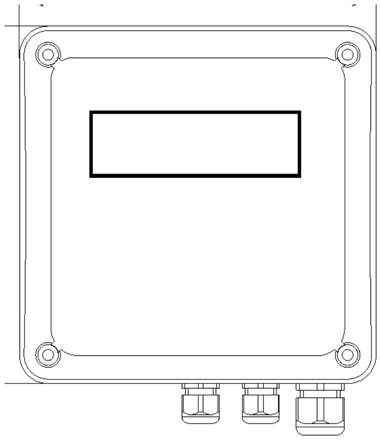






ÍNDICE

1 Antes de empezar pág. 2
2 Instalación pág. 3
3 Configuraciones y funcionamiento pág. 5
4 Guía para la resolución de problemas pág. 11

1 ANTES DE EMPEZAR

1.1 BIENVENIDO

➲ Se ruega leer atentamente el presente manual, poniendo especial atención a las advertencias y a las precauciones. Se tienen que respetar siempre los procedimientos de seguridad necesarios, utilizando las protecciones adecuadas para el rostro y los ojos, y llevando ropa de protección.

1.2 CONTENIDO DEL EMBALAJE

- Instrumento de medición
- Soportes de fijación
- Manual de instrucciones

1.3 CARACTERÍSTICAS TÉCNICAS

Campo de medida química: 0÷14.0 pH ó ± 1500 mV para el Redox
Precisión: 1% FS pH o 1% FS Redox

Impedancia de entrada medida química: 1 x 10^{13} oHm
Conexión sonda medida química: BNC.
Calibración sondas: Asistida por Software

Campo de medida de la temperatura: de 0 a +100 °C (Resolución 1 °C)
Compensación automática de la temperatura de 0 a 100 °C mediante sensor PT100 o configuración manual en el instrumento.

Salida del relé: Número 2 Punto de ajuste (carga máx. 10 A 250 Vca resistivo)

Salida en corriente: Número 1 (carga máx 500 ohm) [Precisión ± 2% fondo escala]

Entrada: 15÷30 Vca/cc

Alimentación: 90÷265 Vca 50/60 Hz
Absorción: 5VA Máx
Fusible: 500 mA (retardado)

Display: LCD 2 líneas 16 caracteres
Teclado: Número 4 teclas

Dimensiones mecánicas: Din Rail panel; 48 x 96 x 98 mm panel, 96 x 96 panel, 144 x 144 pared.
Grado de protección:

- ➢ Din-Rail = IP40
- ➢ 48x96 = IP40
- ➢ 96x96 = IP65 delantero panel
- ➢ 144x144 = IP65 por completo caja

1.4 ADVERTENCIAS

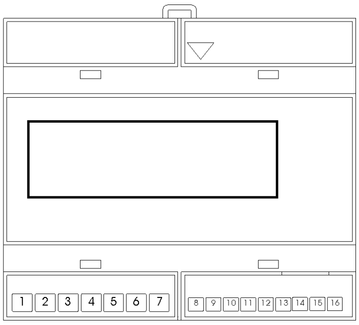
✋ Lea atentamente este manual antes de realizar la instalación y puesta en marcha del sistema.
✋ El grupo de dosificación se debe conectar a la tensión de alimentación por medio de un dispositivo de interrupción omnipolar con una distancia máxima de abertura igual a 3 mm.
✋Controle el modelo del aparato que ha adquirido para consultar las referencias de instalación, ajuste y programación presentes en este manual.
✋Para todas las conexiones, consulte el plano del circuito de control que se incluye en el manual.
☠ ATENCIÓN: Siga siempre los procedimientos de seguridad necesarios, incluyendo el uso de protecciones adecuadas para los ojos, la cara, las manos y la ropa.
☠ ATENCIÓN: Durante la instalación o el mantenimiento del equipo es preciso desconectar siempre la alimentación.
➲ La empresa Seko trabaja constantemente para perfeccionar todos sus productos, por lo que se reserva la facultad de realizar modificaciones en cualquier momento y sin previo aviso.
➲ La inobservancia de las normas contenidas en este manual puede causar daños a personas o cosas y estropear el equipo o alterar su funcionamiento.

1.5 MATERIAL NECESARIO PARA LA INSTALACIÓN

Procúrese las herramientas necesarias para fijar el instrumento.

2 INSTALACIÓN Mecánica y Eléctrica

2.1.___Versión Din Rail (6 módulos Din EN50022)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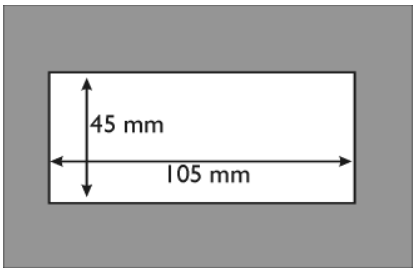
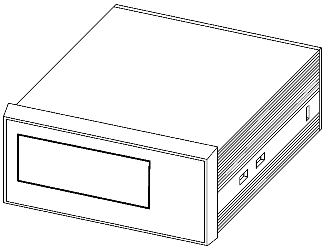
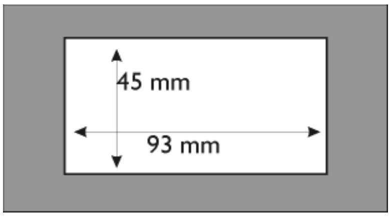
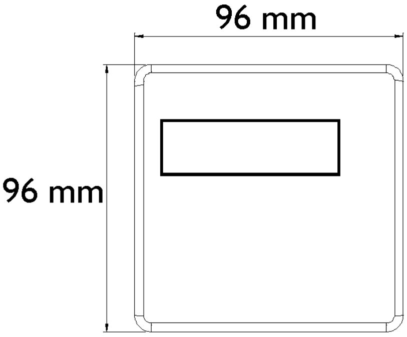


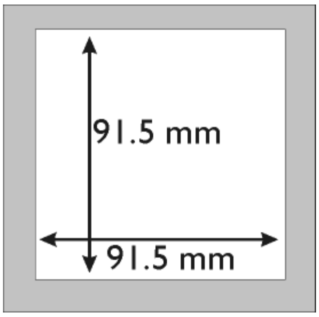
2.2___Versión 48 x 96 x 100



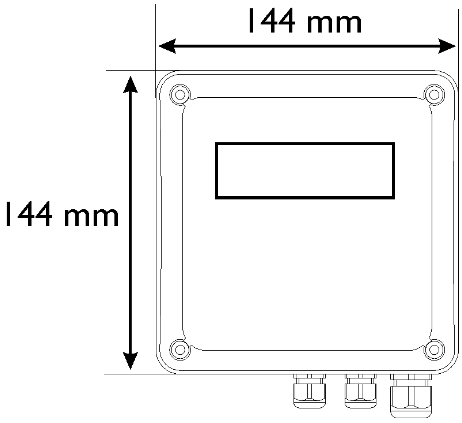


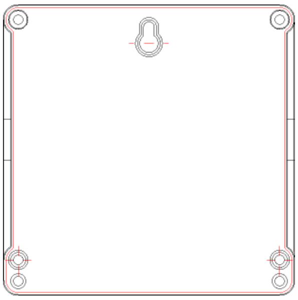
2.3___Versión 96 x 96 x 92

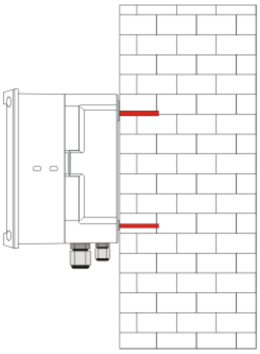



91.5 mm
91.5 mm

2.4__Versión 144 x 144 x 90


144 mm
144 mm



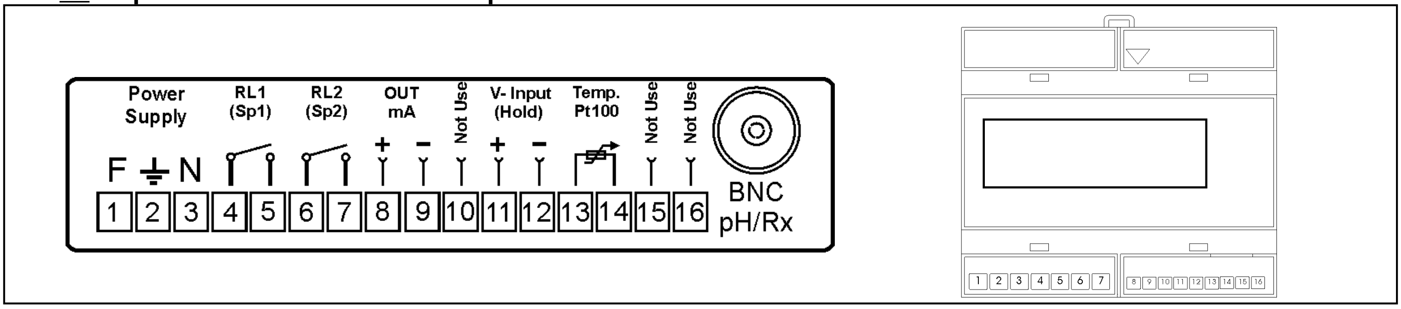


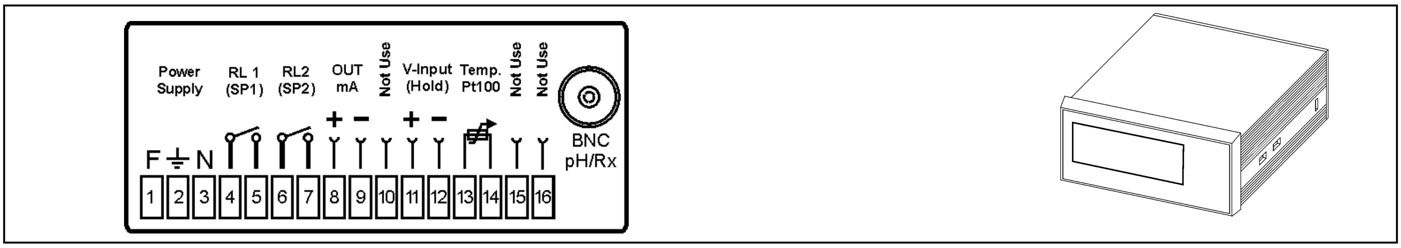
2.5 Descripción conexiones eléctricas

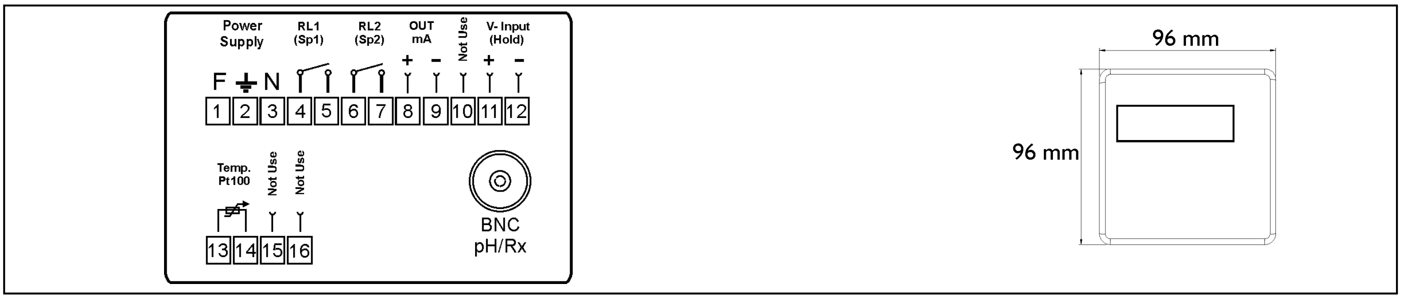
2.5.1__Tabla de conexiones eléctricas

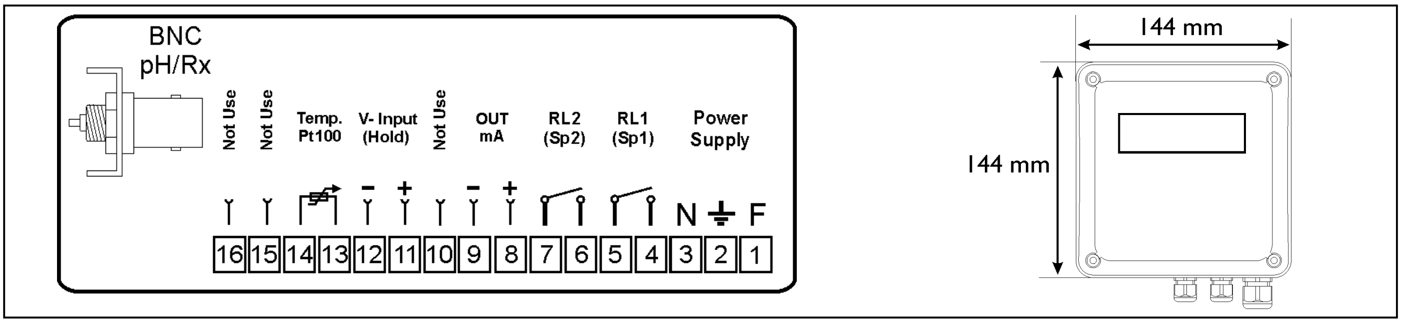
Borne	Descripción
1	Fase (Alim. 230 Vca
2	Tierra
3	Neutro (Alim. 230 Vca)
4-5	Relé punto de ajuste 1
6-7	Relé punto de ajuste 2
8-9	Salida en corriente 0/4÷20 mA
10	No utilizado
11-12	Entrada VCC 15÷30 Vcc **Hold**
13-14	Entrada sonda temperatura
15-16	No utilizado
BNC	Entrada sonda pH/Redox

2.5.2__Etiqueta conexiones eléctricas para cada modelo


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16


Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx
96 mm
96 mm

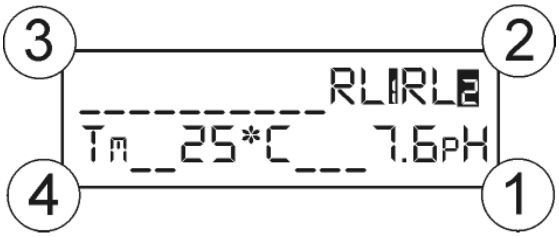

BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
144 mm
144 mm

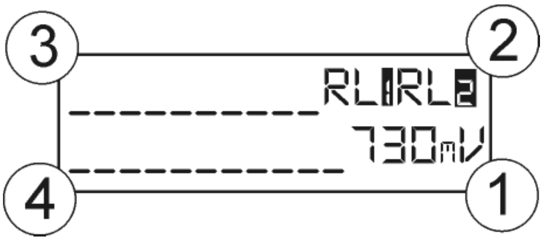
2.6 CONEXIONES HIDRÁULICAS

Ninguna

3.0___CONFIGURACIONES Y FUNCIONAMIENTO

3.1__Visualización instrumento





Área 1 = Visualización medida química pH o Redox
Área 2 = Visualización estado Relé 1 y 2, si el número del relé parpadea, el contacto ha cambiado de estado
Área 3 = Visualización de las alarmas
Área 4 = Visualización temperatura manual o automática para la medida del pH; en la versión Redox área vacía
Nota: el icono RL2 se transforma en RLA cuando el punto de ajuste 2 se configura con función de alarma.

3.2__Teclado instrumento

Sal/Modalidad = Tecla de doble función **Sal** = Salida inmediata del menú **Modalidad** = menú regulaciones rápidas
Intro/ Cal = Tecla de doble función **Intro** = Confirma función **Cal** = Acceso inmediato calibración
Arriba = Tecla incremento
Abajo = Tecla disminución

Función calibración sonda *(Pulsar la tecla **Cal** durante 3 segundos [pulsar Sal para salir])*

- *Calibración sonda pH*
  - Sumergir la sonda en la solución 7 pH y pulsar Intro
  - Esperar 60 segundos para la autocalibración; al terminar se visualiza la precisión de la sonda en grados porcentuales.
  - Sumergir la sonda en la solución 4 pH o 9.22 pH y pulsar Intro
  - Esperar 60 segundos para la autocalibración; al terminar se visualiza la precisión de la sonda en grados porcentuales.
- *Calibración sonda Redox*
  - Sumergir la sonda en la solución 465 mV y pulsar Intro
  - Esperar 60 segundos para la autocalibración; al terminar se visualiza la precisión de la sonda en grados porcentuales.

Función Modalidad (menú rápido) *(Pulsar la tecla **Modalidad** durante 1 segundo, seleccionar con la tecla Arriba y Abajo)*

- PuntoDeAjuste 1   7.4pH (Pulsar la tecla Intro y regular el valor con la tecla Arriba y Abajo)
- PuntoDeAjuste 2   7.4pH (Pulsar la tecla Intro y regular el valor con la tecla Arriba y Abajo)
- Relé 1 (Pulsar la tecla Intro para cambiar el estado del relé)
- Relé 2 (Pulsar la tecla Intro para cambiar el estado del relé)

Nota: después de 10 segundos el instrumento sale de manera automática

Función menú Configuración de valores *(Pulsar las teclas **Intro** y **Sal** durante 5 segundos)*

- Idioma (Programar el idioma en el que se visualizarán los menús)
  - Los idiomas disponibles son: inglés (UK), francés (FR), español (ES), alemán (DE) e italiano (IT)
- PuntoDeAjuste 1 (Programar las funciones de dosificación o control mediante relé 1)
- PuntoDeAjuste 2 (Programar las funciones de dosificación o control mediante relé 2)
- Temperatura (Menú disponible solo para medida del pH)
- Output mA (Programar salida en corriente)
- Avanzado (menú de gestión técnica)

Función de restablecimiento parámetros de fábrica

- Apagar el instrumento
- Pulsar las teclas **Arriba** y **Abajo** juntas y poner en marcha el instrumento
- El instrumento muestra el mensaje **init._Default,** seleccionar **Yes** con las teclas Arriba o Abajo y pulsar Intro
- El instrumento vuelve a cargar todos los parámetros de fábrica

Nota: Para salir de los menús, pulsar **Sal**

3.3__CONFIGURACIONES GENERALES

Presione simultáneamente las teclas **Intro y Sal** en el menú de programación de valores:

Menú Programación (Parámetros de fábrica)	
Idioma	
Programación del idioma	ES
Punto de ajuste 1	
Valor punto de ajuste	7,4 pH
Tipo de dosificaciones	Ácido
Banda proporcional	0,4 pH
Histéresis	0,0 pH
Temporizador ON	OFF
Temporizador OFF	OFF
Delay Start (Inicio retraso)	OFF
Delay End (Fin de retraso)	OFF
Punto de ajuste 2 (Se puede seleccionar Dosificación o Alarma punto de ajuste 1, ver menú avanzado)	
Valor punto de ajuste	7,4 pH
Tipo de dosificaciones	Ácido
Banda proporcional	0,4 pH
Histéresis	0,0 pH
Temporizador ON	OFF
Temporizador OFF	OFF
Delay Start	OFF
Delay End	OFF
Temperatura (*)	
Unidad de medida	°C
Valor manual	25 °C
Output mA	
Intervalo 0/4÷20 mA	4÷20 mA
Valor para 0/4 mA	Valor 0 pH
Valor para 20 mA	Valor 14 pH
Avanzado	
Selecciona medida pH/Redox	pH
Punto de ajuste 2 Dosificación o Alarma	Dosificación
Entrada Hold habilitada o inhabilitada	Inhabilitada = ON
Calibración habilitada o inhabilitada	Habilitada = ON
Estadísticas	
Número alarmas medida	0
Número accionamientos RL1	0
Número accionamientos RL2	0
Número de señales de entrada Hold	0
Restablecimiento estadísticas	
Panel de control	
Contacto relé 1 normalmente abierto o cerrado	Normalmente abierto
Contacto relé 2 normalmente abierto o cerrado	Normalmente abierto
Salida en corriente valor manual	Generador de corriente 0÷20 mA
Señal sonda en entrada en mV	Visualiza la señal en mV
Señal Hold presente	Señal presente ON; ausente OFF
Calibración sonda temperatura (**)	Programar valor de corrección
Valor Offset calibración	Offset en % última calibración
Valor Ganancia calibración (*)	Ganancia en % última calibración
Revisión microcódigo	X.X
Restablecimiento instrumento	Restablece los valores de fábrica
Contraseña	0000

*menú presente solo con medida pH

** menú presente solo con sonda de temperatura instalada

3.3__Configuraciones detalladas del menú de programación

Pulse las teclas Intro y Sal simultáneamente durante 5 segundos; de este modo se accede al menú de programación del instrumento.

Idioma menú: seleccione el idioma deseado. Puede elegir entre las opciones:

Italiano
Inglés
Francés
Español
Alemán

Punto de ajuste 1 menú: para configurar los parámetros de dosificación. Todas las regulaciones serán activadas por el Relé 1 El menú contiene las siguientes voces:

Voz	Valor predefinido	Límites
Valor punto de ajuste	7,4 pH /750 mV	0÷14 pH / ± 1500 mV
Tipo de dosificaciones	Ácida / Baja	Ácida o alcalina/ Alta o baja
Banda proporcional	0,4 pH /40 mV	0,4÷3 pH / 40÷300 mV
Histéresis	0,0 pH; 0 mV	0÷3 pH / 0÷300 mV
Temporizador ON	OFF	OFF…1÷480 minutos
Temporizador OFF	OFF	OFF…1÷480 minutos
Delay Start	OFF	OFF…3÷960 Segundos
Delay End	OFF	OFF…3÷960 Segundos

Punto de ajuste 2 menú: para configurar los parámetros de dosificación. Todas las regulaciones serán activadas por el Relé 2. El menú contiene las mismas voces que el punto de ajuste 1 si se utiliza con la función **PUNTO DE AJUSTE 2 = Dosificación** (ver menú avanzado, pág.8).

Si programamos la función **PUNTO DE AJUSTE 2 = ALARMA** (ver menú **Avanzado,** pág. 8), podemos utilizar el Relé 2 como alarma de medida relacionada con el punto de ajuste 1, de manera que el menú se modifica como se explica a continuación:

Voz	Valor predefinido	Límites
Banda alarma punto de ajuste 1	3 pH; 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (alarma sobre carga punto de ajuste 1)	OFF	OFF÷960 minutes

Temperatura menú: programar el valor de temperatura para la compensación automática de la medida del pH. También se puede programar la unidad de medida.

Voz	Valor predefinido	Límites
Unidad de medida	°C	°C; °F
Valor manual	25 °C	0÷100 °C; 32÷212 °F

Salida en corriente programar la escala y los valores de la salida en corriente

Voz	Valor predefinido	Límites
Escala 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Valor 0/4 mA (*)	0 pH; -1500 mV	0÷14 pH; ± 1500 mV
Valor 20 mA (*)	14 pH; + 1500 mV	0÷14 pH; ± 1500 mV

(* En las voces indicadas se puede programar el valor opuesto de la escala y obtener de este modo la inversión de la rampa 20 ÷ 4/0 mV)

Menú avanzado: Mediante las siguientes voces se pueden modificar las funciones del instrumento y controlar cada una de ellas; este menú debe ser utilizado solamente por personal técnico especializado.

Voz	Valor predefinido	Límites
Selecciona medida pH/Redox	pH	pH; Redox
Punto de ajuste 2 Dosificación o Alarma	Dosificación	Dosificación o Alarma SP1
Entrada Hold habilitada o inhabilitada	ON	OFF= Inhabilitada; ON= Habilitada
Calibración habilitada o inhabilitada	ON	OFF= Inhabilitada; ON= Habilitada

Con el menú de *Estadísticas* se puede controlar el número de activaciones o variaciones que se han realizado en el instrumento.

Estadísticas	
Número alarmas medida	0
Número accionamientos RL1	0
Número accionamientos RL2	0
Número de señales de entrada Hold	0
Restablecimiento estadísticas	

Con el menú del *Panel de control* se puede configurar y controlar manualmente cada acción de entrada y salida presente en el instrumento para facilitar la tarea del instalador durante la prueba de idoneidad de la instalación.

Panel de control	
Contacto relé 1 normalmente abierto o cerrado	Normalmente abierto
Contacto relé 2 normalmente abierto o cerrado	Normalmente abierto
Salida en corriente valor manual	Generador de corriente 0÷20 mA
Señal sonda en entrada en mV	Visualiza la señal de la sonda en mV
Señal Hold presente	Señal presente ON; ausente OFF
Calibración sonda temperatura (**)	Programar valor de corrección
Valor Offset calibración	Offset en % última calibración
Valor Ganancia calibración (*)	Ganancia en % última calibración
Revisión microcódigo	X.X

*menú presente solo con medida pH

** menú presente solo con sonda de temperatura instalada

Nota: En el menú del *Panel de Control* el instrumento no sale automáticamente puesto que permite que el instalador trabaje en modalidad manual. Para salir pulse la tecla SAL.

Con el menú *Restablecimiento instrumento* es posible restablecer todos los parámetros de fábrica y salir automáticamente del menú de programación. Los parámetros de fábrica están indicados en la página 6.

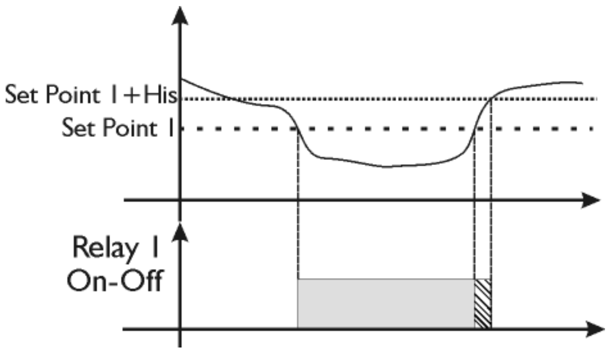
Restablecimiento instrumento	Restablece los valores de fábrica

Con el menú *Contraseña* se puede proteger el menú de programación para impedir su acceso al personal no autorizado. La contraseña estándar es 0000. En caso de perder u olvidar la contraseña programada, utilizar el menú oculto de la página 5 para restablecer los parámetros predefinidos.

Contraseña	0000

3.4__Ejemplos de dosificación y regulación

Dosificación Pausa/Trabajo (ON-OFF)

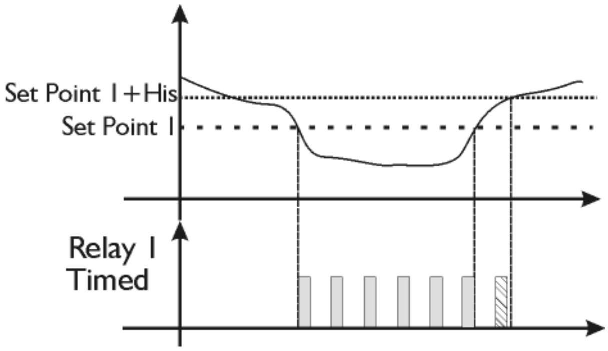


El instrumento permite controlar y modificar automáticamente la medida química mediante el punto de ajuste 1, regulando la dosificación con el relé 1 en modalidad Pausa/Trabajo.
Configurando los siguientes parámetros se obtiene la dosificación que aparece al lado:

- Punto de ajuste 1 = 7.20 pH
- Tipo dosificación = Alcalina
- Banda proporcional = OFF
- Histéresis = 0.40
- Temporizador On = OFF
- Temporizador OFF = OFF

El instrumento iniciará la dosificación a partir de valores inferiores a 7,20 y terminará la dosificación con valores superiores a 7,60; modificando la voz Tipo de dosificación con Ácido la dosificación será exactamente opuesta: iniciará superando 7,20 y terminará con un valor inferior a 6,80 pH. El instrumento permite efectuar dos dosificaciones de manera independiente programando el punto de ajuste 2 al que está asociado el relé 2.

Dosificación temporizada (Timed)

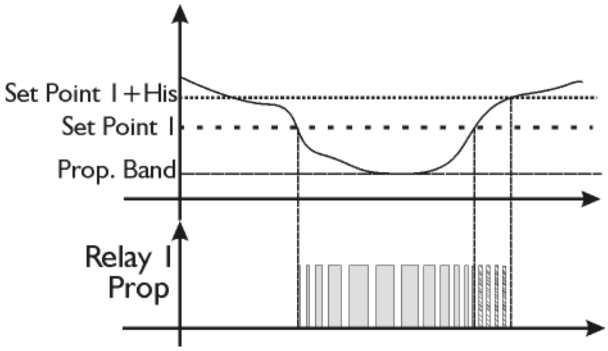


El instrumento permite controlar y modificar automáticamente la medida química mediante el punto de ajuste 1, regulando la dosificación con el relé 1 en modalidad Tiempo Fijos.
Configurando los siguientes parámetros se obtiene la dosificación que aparece al lado:

- Punto de ajuste 1 = 7.20 pH
- Tipo Dosificación = Alcalina
- Banda proporcional = OFF
- Histéresis = 0.40
- Temporizador On = 5 minutos
- Temporizador OFF = 10 minutos

El instrumento iniciará la dosificación temporizada a partir de valores inferiores a 7,20 y terminará la dosificación con valores superiores a 7,60; modificando la voz Tipo de dosificación con Ácido la dosificación será exactamente opuesta: iniciará superando 7,20 y terminará con un valor inferior a 6,80 pH. El instrumento permite efectuar dos dosificaciones de manera independiente programando el punto de ajuste 2 al que está asociado el relé 2.

Dosificación proporcional (Prop)



El instrumento permite controlar y modificar automáticamente la medida química mediante el punto de ajuste 1, regulando la dosificación con la activación del relé 1 en modalidad Tiempo proporcional.
Configurando los siguientes parámetros se obtiene la dosificación que aparece al lado:

- Punto de ajuste 1 = 7.20 pH
- Tipo Dosificación = Alcalina
- Banda proporcional = 0,40 pH
- Histéresis = 0.40
- Temporizador On = 10 minutos (*)
- Temporizador OFF = 10 minutos (*)

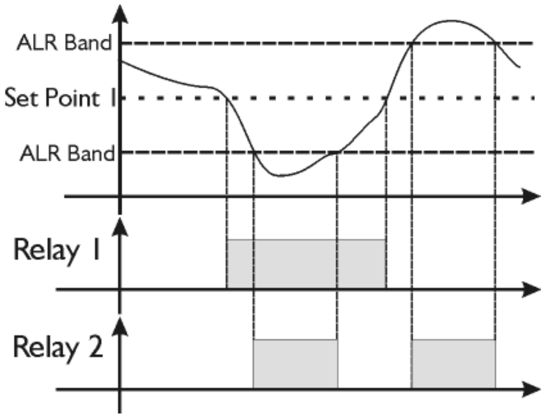
El instrumento iniciará la dosificación proporcional a partir de valores inferiores a 7,20 y terminará la dosificación con valores superiores a 7,60; modificando la voz Tipo de dosificación con Ácido la dosificación será exactamente opuesta: iniciará superando 7,20 y terminará con un valor inferior a 6,80 pH. El instrumento permite efectuar dos dosificaciones de manera independiente programando el punto de ajuste 2 al que está asociado el relé 2.

(* programando tiempos iguales en las variables *Temporizador ON y OFF*, el instrumento calcula un periodo total que modifica automáticamente en función de la variación de la medida química en la banda de histéresis dosifica al valor mínimo)

Nota: Todas las configuraciones de regulación y dosificación son válidas también para la medida Redox.

Relé 2 utilizado como alarma para el punto de ajuste 1

Programando la Banda alarma se crea una ventana de trabajo: al superar los límites permitidos el relé 2 se cierra, y permanece cerrado hasta que se restablece la medida o bien hasta que se pulsa la tecla Intro para desactivar la alarma.



Programando el tiempo OFA (alarma sobre carga) se controla la dosificación del punto de ajuste 1 en tiempo subdividido en dos alarmas:

- Primera alarma: al 70% del tiempo programado se visualiza en el display y el relé 2 se cierra.
- Segunda alarma: al 100% del tiempo programado se visualiza en el display y el relé 2 se cierra.

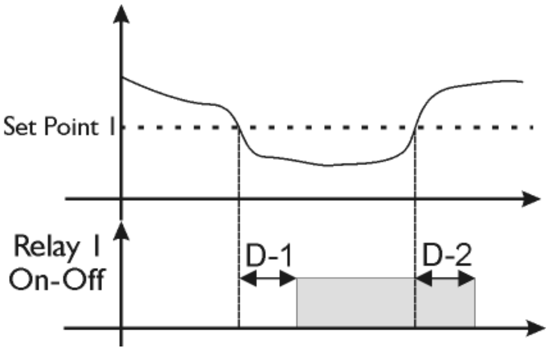
Desactivar la alarma pulsando la tecla Intro.
Nota: el icono RL2 se transforma en RLA.

Dosificación con tiempos de retraso

El instrumento permite retrasar el inicio y el final de la dosificación. Configurando los siguientes parámetros se obtiene la dosificación que aparece al lado:

- Delay Start (D-1) = 5 minutos
- Delay End (D-2) = 5 minutos

Esta función está disponible en todas las regulaciones descritas precedentemente ON-OFF, Temporizada, Proporcional.



Nota: Las variables mencionadas están presentes tanto en el punto de ajuste 1 como en el punto de ajuste 2 de manera independiente.

4 GUÍA PARA LA RESOLUCIÓN DE PROBLEMAS

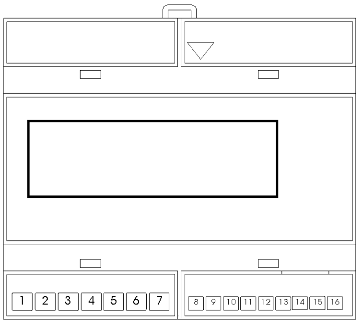
- **No se enciende…**
  - Comprobar si se han conectado correctamente los cables de alimentación
  - Comprobar si está presente la alimentación de red
- **No se ilumina el display…**
  - Regular el contraste de iluminación del display
- **La medida química no funciona…**
  - Controlar la conexión de la sonda
  - Realizar la calibración como se describe en el manual
  - Sustituir la sonda
- **La salida mA no varía…**
  - Controlar la conexión de los cables
  - Controlar, por medio del Menú Principal “Control Manual”, si la salida produce el efecto deseado
  - Controlar las características eléctricas del dispositivo remoto (carga máx. 500 ohm)
- **Los relés no funcionan…**
  - Comprobar si el instrumento está alimentado correctamente
  - Controlar las programaciones en el menú principal
- **La tensión en la puerta Vcc En no bloquea el instrumento…**
  - Controlar las conexiones eléctricas
  - Comprobar si el generador remoto está funcionando.

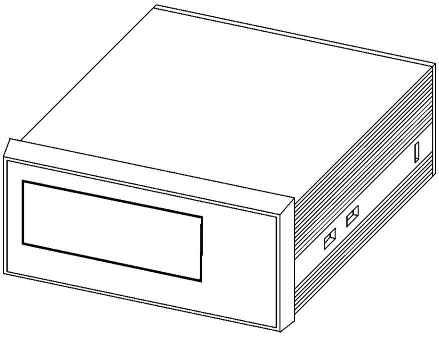
Nota: En caso de anomalía persistente, contactar al suministrador.

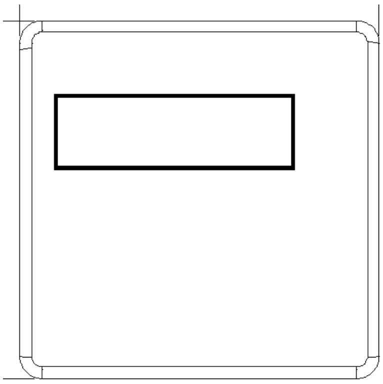
4.1 Tabla de visualización de alarmas:

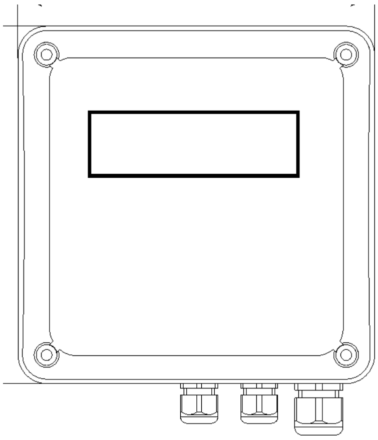
Alarma	Visualización	Estado relé	Posible solución	Prioridad
Hold	ALR Hold	RL1 y RL2 inhabilitados	Eliminar señal en la entrada tensión Hold	1
OFA pre-alarma Tiempo >70%	OFA ALR	RL2 Cerrado	- Pulsar Intro para desactivar la alarma - Controlar la instalación	2
OFA Alarma Tiempo =100%	OFA Stop	RL2 Cerrado	- Pulsar Intro para desactivar la alarma - Controlar la instalación	3
Banda de Alarma medida	Banda ALR	RL2 Cerrado	- Pulsar Intro para silenciar el relé 2 - Controlar la instalación	4

Instrument pour mesurer le pH ou Redox


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16







INDEX

1 Opérations préliminaires page 2
2 Installation page 3
3 Configurations et fonctionnement page 5
4 Guide à la solution des problèmes page 11

1 OPÉRATIONS PRÉLIMINAIRES

1.1 BIENVENUE

➲ Prière de lire attentivement ce manuel, en prêtant une attention particulière aux avertissements ainsi qu'aux précautions. Suivre toujours les procédures de sécurité nécessaires, y compris l'utilisation de protections appropriées pour le visage, les yeux et les vêtements.

1.2 LE CONTENU DE L'EMBALLAGE

- Instrument de mesure
- Supports de fixage
- Manuel d'instructions

1.3 CARACTERISTIQUES TECHNIQUES

Plage de mesure chimique : 0÷14.0 pH ou ±1500 mV pour le Redox
Précision : 1% FS pH ou 1% FS Redox

Impédance entrée mesure chimique : 1 x 10^{13} ohm
Connexion sonde mesure chimique : BNC.
Calibrage sondes : Assisté par Logiciel

Plage de mesure température : de 0 à +100 °C (Résolution 1 °C)
Compensation automatique de la température de 0 à 100 °C par l'intermédiaire d'un capteur PT100 ou configuration manuelle sur l'instrument.

Sortie relais : 2 Set Point (charge max 10 A 250 Vca résistif)

Sorties en Courant : 1 (charge max 500 ohm) [Précision ±2% Pleine Échelle]

Entrée : 15÷30 Vca/dc

Alimentation : 90÷265 Vca 50/60 Hz
Absorption : 5 VA Max
Fusible : 500 mA (retardé)

Afficheur : LCD 2 lignes 16 caractères
Clavier : 4 touches

Dimensions mécaniques : Din Rail tableau ; 48 x 96 x 98 mm tableau, 96 x 96 tableau, 144 x 144 mur.

Niveau de protection :

- Din-Rail = IP40
- 48x96 = IP40
- 96x96 = IP65 avant le panneau
- 144x144 = IP65 boîte complète

1.4 AVERTISSEMENTS

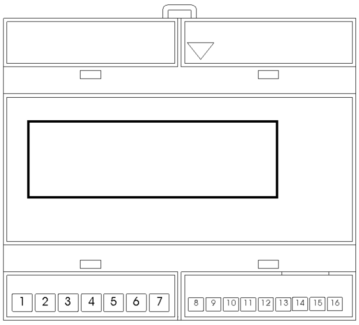
✋ Lire attentivement ce manuel avant de procéder à l'installation et à la mise en marche du système.
✋ Le groupe de dosage doit être relié au courant d'alimentation par l'intermédiaire d'un dispositif d'interruption omnipolaire avec distance d'ouverture supérieure ou égale 3 mm.
✋ Vérifier le modèle d'équipement acquis pour les références d'installation, la configuration et la programmation contenues dans ce manuel.
✋ Pour tous les branchements, se référer à la carte topographique du circuit de contrôle reporté dans ce manuel.
☠ ATTENTION : Suivre toujours les procédures de sécurité nécessaires, y compris l'utilisation de protections appropriées pour le visage, les yeux et les vêtements.
☠ ATTENTION : Débrancher toujours l'alimentation durant l'installation ou l'entretien de cet appareil.
➲ L'entreprise travaille constamment au perfectionnement de tous les produits, en se réservant la faculté d'apporter des modifications à tout moment et sans aucun préavis.
➲ Le non respect des normes contenues dans ce manuel pourrait endommager des biens ou nuire à des personnes et compromettre le fonctionnement ou endommager l'appareil.

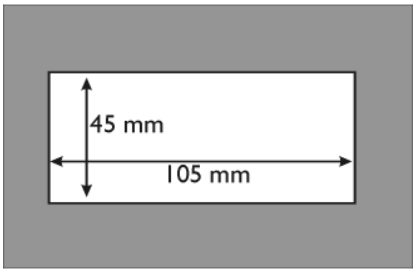
1.5 MATERIEL NECESSAIRE POUR L'INSTALLATION

Se munir d'un outillage pour fixer l'instrument.

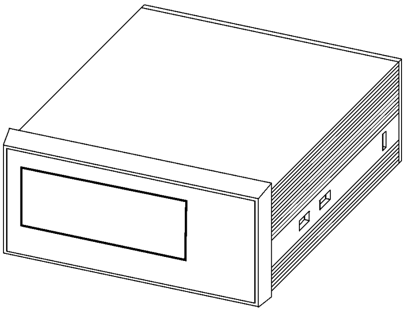
2 INSTALLATION Mécanique et Electrique

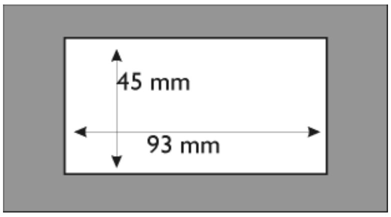
2.1.___Version Din Rail (6 modules Din EN50022)


1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16

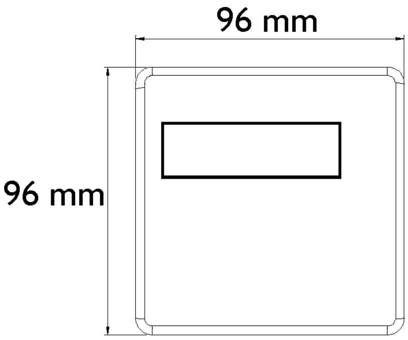


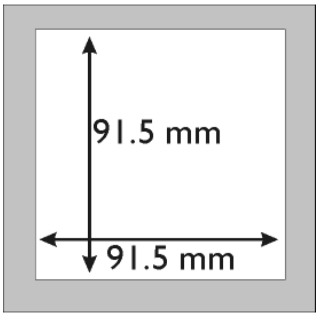
2.2___Version 48 x 96 x 100



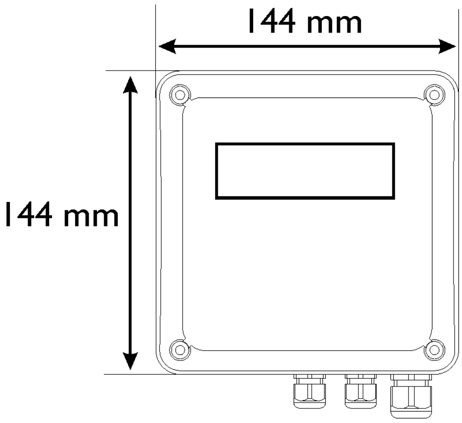


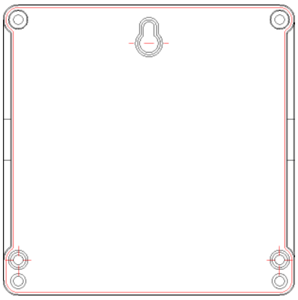
2.3___Version 96 x 96 x 92

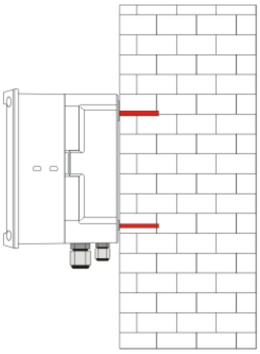



91.5 mm
91.5 mm

2.4__Version 144 x 144 x 90


144 mm
144 mm



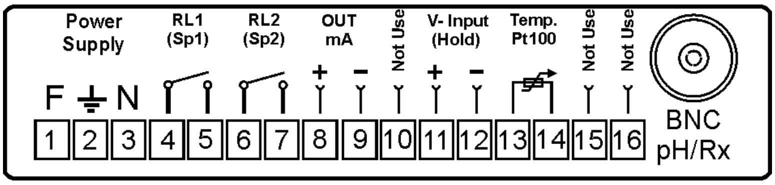


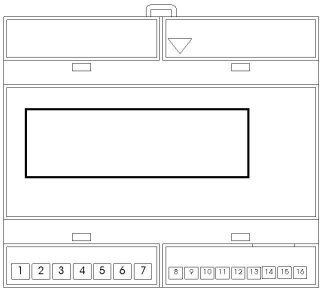
2.5 Description branchements électriques

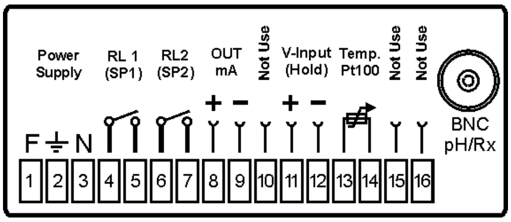
2.5.1__Tableau connexions électriques

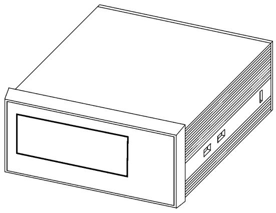
Borne	Description
1	Phase (Alim.230 Vca
2	Terre
3	Neutre (Alim. 230 Vca)
4-5	Relais Set Point 1
6-7	Relais Set Point 2
8-9	Sortie en courant 0/4÷20 mA
10	Non utilisé
11-12	Entrée VCC 15÷30 Vcc **Hold**
13-14	Entrée Sonde Température
15-16	Non utilisé
BNC	Entrée sonde pH/Redox

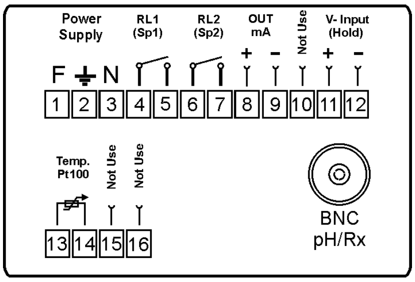
2.5.2__Etiquette connexions électriques pour chaque modèle

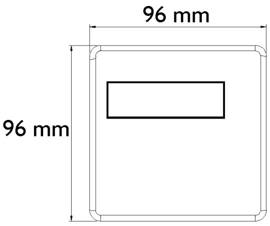

Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
F ⏚ N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx

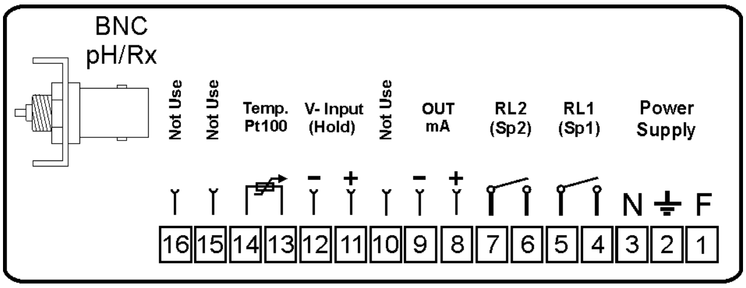

1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16

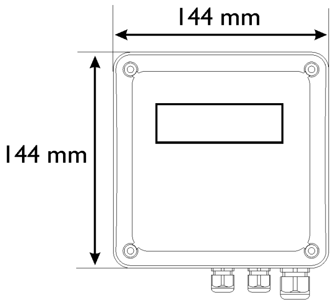

Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
F ⏚ N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx




Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
F ⏚ N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx




BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N ⏚ F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

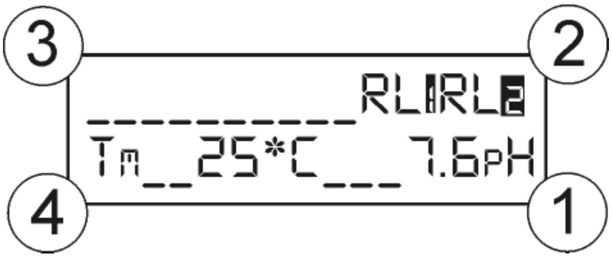

144 mm
144 mm

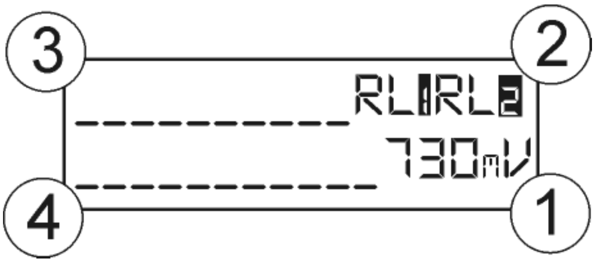
2.6 CONNEXIONS HYDRAULIQUES

Aucune

3.0___CONFIGURATIONS ET FONCTIONNEMENT

3.1__Affichage Instrument





Zone 1 = Affichage mesure chimique pH ou Redox
Zone 2 = Affichage état Relais 1 et 2, si le numéro du relais clignote, le contact a changé d'état
Zone 3 = Affichage des alarmes
Zone 4 = Affichage température manuelle ou automatique pour la mesure pH ; sur la version Redox zone vide
Remarque : l'icône RL2 se transforme en RLA quand le Set Point 2 se configure comme fonction Alarme.

3.2__Clavier instrument

Esc/Mode = Touche avec double fonction **Esc** = Sortie immédiate du menu **Mode**= menu réglages rapides
Enter/ Cal = Touche avec double fonction **Enter** = Confirmation fonction **Cal** = Accès immédiat calibrage
Haut = Touche incrément
Bas = Touche décrément

Fonction Calibrage sonde *(Appuyer sur la touche **Cal** pendant 3 secondes [appuyer sur Esc pour quitter])*

- *Calibrage sonde pH*
  - Immerger la sonde dans la solution 7 pH et appuyer sur enter.
  - Attendre 60 secondes auto-calibrage à la fin affiche la validité de la sonde en degrés de pourcentage.
  - Immerger la sonde dans la solution 4 pH ou 9.22 pH et appuyer sur enter.
  - Attendre 60 secondes auto-calibrage à la fin affiche la validité de la sonde en degrés de pourcentage.
- *Calibrage sonde Redox*
  - Immerger la sonde dans la solution 465 mV et appuyer sur enter.
  - Attendre 60 secondes auto-calibrage à la fin affiche la validité de la sonde en degrés de pourcentage.

Fonction Mode (menu rapide) *(Appuyer sur la touche **Mode** pendant 1 seconde, sélectionner à l'aide de la touche haut et bas)*

- Set point 1   7.4pH (Appuyer sur la touche Enter et régler la valeur à l'aide des touches haut et bas)
- Set point 2   7.4pH (Appuyer sur la touche Enter et régler la valeur à l'aide des touches haut et bas)
- Relais 1 (Appuyer sur la touche Enter pour changer l'état au relais)
- Relais 2 (Appuyer sur la touche Enter pour changer l'état au relais)

Remarque : après 10 secondes l'instrument sort de manière automatique

Fonction menu Configuration valeurs *(Appuyer sur les touches **Enter** et **Esc** pendant 5 secondes)*

- Langue (Sélectionner la langue d'affichage du menu)
  - Disponible en Anglais (UK), Français (FR), Espagnol (ES), Allemand (DE), Italien (IT)
- Set point 1 (Sélectionner les fonctions de dosage ou de contrôle par relais 1)
- Set point 2 (Sélectionner les fonctions de dosage ou de contrôle par relais 2)
- Température (Menu disponible uniquement pour mesure pH)
- Output mA (Configurer sortie en courant)
- Avancé (menu de gestion technique)

Fonction de restauration paramètres d'usine

- Eteindre l'instrument
- Appuyer dans le même temps sur les touches **Haut** et **Bas** et allumer l'instrument
- L'instrument affiche init._Default, sélectionner avec les touches Haut ou Bas Yes et appuyer sur Enter
- L'instrument recharge tous les paramètres par défaut

Remarque : Pour quitter les menus appuyer sur **esc**

3.3__CONFIGURATIONS GENERALES

Appuyer dans le même temps sur les touches **Enter et Esc** Programmation Valeurs :

Menu Programmation (Paramètres d'usine)	
Langue	
Sélection langue	FR
Set point 1	
Valeur Set point	7,4 pH
Type dosages	Acide
Bande Proportionnelle	0.4 pH
Hystérésis	0,0 pH
Minuteur ON	OFF
Minuteur OFF	OFF
Delay Start (retard démarrage)	OFF
Delay End (retard arrêt)	OFF
Set point 2 (Sélectionnable Dosage ou Alarme Set Point 1 cf. menu avancé)	
Valeur Set point	7.4 pH
Type dosages	Acide
Bande Proportionnelle	0.4 pH
Hystérésis	0,0 pH
Minuteur ON	OFF
Minuteur OFF	OFF
Delay Start	OFF
Delay End	OFF
Température (*)	
Unité de mesure	°C
Valeur Manuelle	25 °C
Output mA	
Plage 0/4÷20 mA	4÷20 mA
Valeur pour 0 / 4 mA	Valeur 0 pH
Valeur pour 20 mA	Valeur 14 pH
Avancé	
Sélectionner mesure pH/Redox	pH
Set point 2 Dosage ou Alarme	Dosage
Entrée Hold Activée ou désactivée	Désactivée = ON
Calibrage Activé ou désactivé	Activé = ON
Statistiques	
Nombre Alarmes mesure	0
Nombre Actionnements RL1	0
Nombre Actionnements RL2	0
Nombre signaux entrée Hold	0
Remise à zéro Statistiques	
Tableau de Commande	
Contact Relais1 Normalement Ouvert ou Fermé	Normalement ouvert
Contact Relais 2 Normalement Ouvert ou Fermé	Normalement ouvert
Sortie en courant valeur manuelle	Générateur de courant 0÷20 mA
Signal sonde en entrée en mV	Affiche le signal en mV
Signal Hold présent	Signal présent ON ; absent OFF
Calibrage sonde température (**)	Configurer valeur de correction
Valeur Offset calibrage	Offset en % dernier calibrage
Valeur Gain calibrage (*)	Gain en % dernier calibrage
Révision Firmware	X.X
Remise à zéro Instrument	Restaure les valeurs d'usine
Mot de passe	0000

*menu présent uniquement avec mesure pH

** menu présent uniquement avec sonde de température installée

3.3__Configurations détaillées menu programmation

Appuyer dans le même temps sur les touches Enter et Esc pendant 5 secondes ; on effectue de cette manière le menu de programmation de l'instrument.

Langue menu : sélectionner la langue désirée, il est possible de choisir entre :

Italien
Anglais
Français
Espagnol
Allemand

Setpoint 1 menu: configurer les paramètres de dosage, tous les réglages seront actionnés par le Relais 1.
Le menu est composé par les rubriques suivantes :

Rubrique	Défaut	Limites
Valeur Set point	7,4 pH /750 mV	0÷14 pH / ±1500 mV
Type dosages	Acide / Bas	Acide ou Alcalin /Haut ou Bas
Bande Proportionnelle	0,4 pH / 40 mV	0,4÷3 pH / 40÷300 mV
Hystérésis	0,0 pH; 0 mV	0÷3 pH / 0÷300 mV
Minuteur ON	OFF	OFF…1÷480 minutes
Minuteur OFF	OFF	OFF…1÷480 minutes
Delay Start	OFF	OFF…3÷960 Secondes
Delay End	OFF	OFF…3÷960 Secondes

Setpoint 2 menu: configurer les paramètres de dosage, tous les réglages seront actionnés par le Relais 2.
Le menu est composé des mêmes rubriques que le Setpoint 1 s'il est utilisé avec la fonction **SETPOINT 2 = Dosage** (cf. menu Avancé page.8).

Si nous sélectionnons la fonction **SETPOINT 2 = ALARME** (cf. menu Avancé page 8), nous pouvons utiliser le Relais 2 comme alarme de mesure liée au Set point 1. Par conséquent le menu se modifie de la manière suivante :

Rubrique	Défaut	Limites
Bande alarme SetPoint 1	3 pH; 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (alarme de surcharge SetPoint 1)	OFF	OFF÷960 minutes

Température menu : configurer la valeur de température pour la compensation automatique de la mesure pH. Il est possible de configurer également l'unité de mesure.

Rubrique	Défaut	Limites
Unité de mesure	°C	°C; °F
Valeur Manuelle	25 °C	0÷100 °C; 32÷212 °F

Sortie en courant : configurer l'échelle ainsi que les valeurs de la sortie en courant**.**

Rubrique	Défaut	Limites
Echelle 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Valeur 0/4 mA (*)	0 pH; -1500 mV	0÷14 pH; ±1500 mV
Valeur 20 mA (*)	14 pH; + 1500 mV	0÷14 pH; ±1500 mV

(* Dans les rubriques indiquées il est possible de configurer la valeur opposée de l'échelle. De cette manière, nous pouvons obtenir l'inversion de la rampe 20 ÷ 4/0 mV)

Menu avancé : Par l'intermédiaire des rubriques suivantes, nous pouvons modifier les fonctions de l'instrument et contrôler chaque fonction ; le menu est réservé au personnel technique spécialisé.

Rubrique	Défaut	Limites
Sélectionne mesure pH/Redox	pH	pH ; Redox
Set point 2 Dosage ou Alarme	Dosage	Dosage ou Alarme SP1
Entrée Hold Activée ou désactivée	ON	OFF = Désactivé ; ON = Activé
Calibrage Activée ou désactivé	ON	OFF = Désactivé ; ON = Activé

A l'aide du menu *Statistiques* suivant, il est possible de vérifier le nombre d'actionnements ou de variations dans l'instrument.

Statistiques	
Nombre Alarmes mesure	0
Nombre Actionnements RL1	0
Nombre Actionnements RL2	0
Nombre signaux entrée Hold	0
Remise à zéro Statistiques	

A l'aide du menu *Tableau de Commande* suivant, il est possible de configurer et de vérifier manuellement chaque action d'entrée et de sortie présente dans l'instrument, et ce afin de faciliter l'installateur durant l'essai de l'installation.

Tableau de Commande	
Contact Relais 1 Normalement Ouvert ou Fermé	Normalement ouvert
Contact Relais 2 Normalement Ouvert ou Fermé	Normalement ouvert
Sortie en courant valeur manuelle	Générateur de courant 0÷20 mA
Signal sonde en entrée en mV	Affiche le signal de la sonde en mV
Signal Hold présent	Signal présent ON ; absent OFF
Calibrage sonde température (**)	Configurer valeur de correction
Valeur Offset calibrage	Offset en % dernier calibrage
Valeur Gain calibrage (*)	Gain en % dernier calibrage
Révision Firmware	X.X

*menu présent uniquement avec mesure pH

** menu présent uniquement avec sonde de température installée

Remarque : Dans le Menu *Tableau de Commande* l'instrument ne sort pas en mode automatique car il permet à l'installateur de travailler en manuel. Pour quitter appuyer sur la touche ESC.

Avec le menu suivant *Remise à zéro Instrument* il est possible de restaurer tous les paramètres d'usine et de sortir automatiquement du menu configurations. Les paramètres d'usine sont mentionnés page 6.

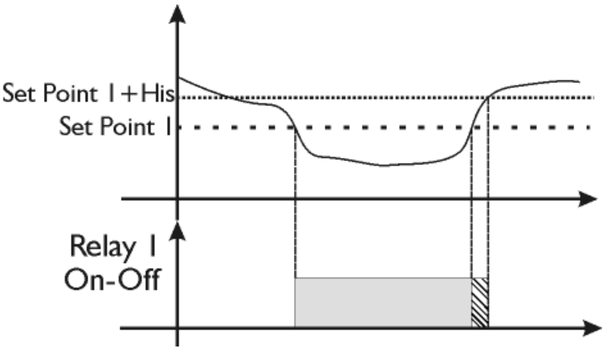
Remise à zéro Instrument	Restaure les valeurs d'usine

Avec le menu suivant *Mot de passe* il est possible de protéger le menu des configurations du personnel non autorisé. Le Mot de passe standard est 0000. En cas de perte ou d'oubli du Mot de passe sélectionné, exécuter le menu caché reporté page 5 afin de restaurer les paramètres par Défaut.

Mot de passe	0000

3.4__Exemples de dosage et réglage

Dosage Pause/Travail (ON-OFF)



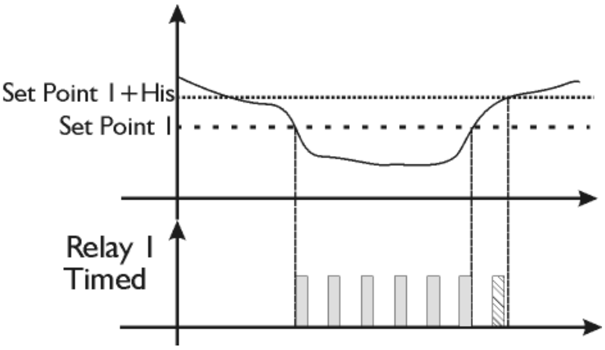
L'instrument permet de contrôler et de modifier la mesure chimique par l'intermédiaire du Set Point 1 en automatique ; en réglant le dosage au travers du relais 1 commandé en Pause/Travail.

En configurant les paramètres suivants, on obtient le dosage illustré à côté :

- Set point 1 = 7.20 pH
- Type Dosage = Alcalin
- Bande Proportionnelle = OFF
- Hystérésis = 0,40
- Minuteur On = OFF
- Minuteur OFF = OFF

L'instrument commencera le dosage pour des valeurs inférieures à 7,20 et terminera le dosage pour des valeurs supérieures à 7,60 ; en modifiant la Rubrique Type de dosage avec Acide, le dosage sera exactement l'opposé : l'instrument commencera le dosage pour des valeurs supérieures à 7,20 et le terminera pour une valeur inférieure à 6,80 pH. L'instrument permet d'effectuer deux dosages de manière indépendante en configurant le Set point 2 auquel est associé le relais 2.

Dosage Temporisé (Timed)



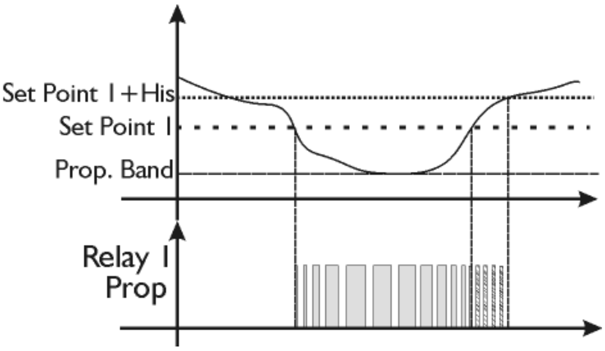
L'instrument permet de contrôler et de modifier la mesure chimique par l'intermédiaire du Set Point 1 en automatique ; en réglant le dosage au travers du relais 1 commandé en Temps Fixes.

En configurant les paramètres suivants, on obtient le dosage illustré à côté :

- Set point 1 = 7,20 pH
- Type Dosage = Alcalin
- Bande Proportionnelle = OFF
- Hystérésis = 0,40
- Minuteur On = 5 minutes
- Minuteur OFF = 10 minutes

L'instrument commencera le dosage temporisé pour des valeurs inférieures à 7,20 et terminera le dosage pour des valeurs supérieures à 7,60 ; en modifiant la Rubrique Type de dosage avec Acide, le dosage sera exactement l'opposé : l'instrument commencera le dosage pour des valeurs supérieures à 7,20 et le terminera pour une valeur inférieure à 6,80 pH. L'instrument permet d'effectuer deux dosages de manière indépendante en configurant le Set point 2 auquel est associé le relais 2.

Dosage Proportionnel (Prop)



L'instrument permet de contrôler et de modifier la mesure chimique par l'intermédiaire du Set Point 1 en automatique ; en réglant le dosage au travers du relais 1 commandé en Temps Proportionnel.

En configurant les paramètres suivants, on obtient le dosage illustré à côté :

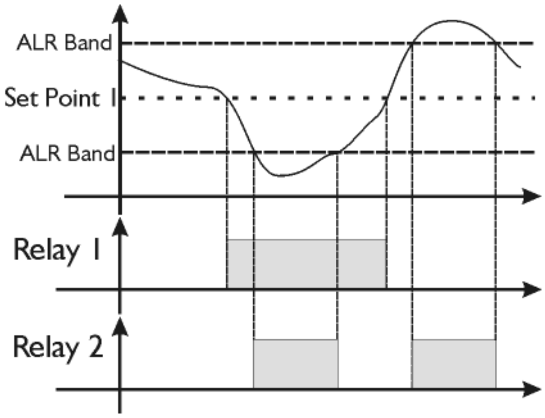
- Set point 1 = 7,20 pH
- Type Dosage = Alcalin
- Bande Proportionnelle = 0,40 pH
- Hystérésis = 0.40
- Minuteur On = 10 minutes (*)
- Minuteur OFF = 10 minutes (*)

L'instrument commencera le dosage pour des valeurs inférieures à 7,20 et terminera le dosage pour des valeurs supérieures à 7,60 ; en modifiant la Rubrique Type de dosage avec Acide, le dosage sera exactement l'opposé : l'instrument commencera le dosage pour des valeurs supérieures à 7,20 et le terminera pour une valeur inférieure à 6,80 pH. L'instrument permet d'effectuer deux dosages de manière indépendante en configurant le Set point 2 auquel est associé le relais 2.

(* en sélectionnant les mêmes temps dans les variables *Minuteur ON et OFF* l'instrument calcule une période totale qui modifie en automatique par rapport à la variation de la mesure chimique dans la bande d'hystérésis dose à la valeur minimale)

Remarque : Toutes les configurations de réglage et de dosage sont valables également pour la mesure Redox.

Relais 2 utilisé comme alarme pour le Set Point 1

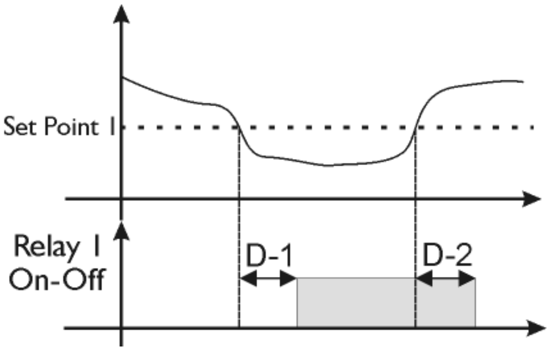


En configurant la Bande alarme, on crée une fenêtre de travail. En dépassant les limites autorisées, le relais 2 se ferme et reste fermé jusqu'à la restauration de la mesure, ou bien appuyer sur la touche enter pour désenclencher l'alarme.

En configurant le temps OFA (Alarme de surcharge) on contrôle le dosage du Set Point 1 en un temps partagé en deux alarmes :
- Première alarme à 70% du temps configuré s'affiche sur l'afficheur et le relais 2 se ferme.
- Deuxième alarme à 100% du temps configuré s'affiche sur l'afficheur et le relais 2 se ferme.

Eliminer l'alarme en appuyant sur la touche Enter.
Remarque : l'icône RL2 se transforme en RLA

Dosage avec temps de retard



L'instrument permet de retarder dans le temps le début et la fin du dosage. En configurant les paramètres suivants, on obtient le dosage illustré à côté :
- Delay Start (D-1) = 5 minutes
- Delay End (D-2) = 5 minutes

Cette fonction est disponible dans tous les réglages décrits précédemment : ON-OFF, Timed, Prop.

Remarque : Les variables susmentionnées sont présentes aussi bien sur le Set Point 1 que sur le Set Point 2 d'une manière indépendante.

4 GUIDE A LA SOLUTION DES PROBLEMES

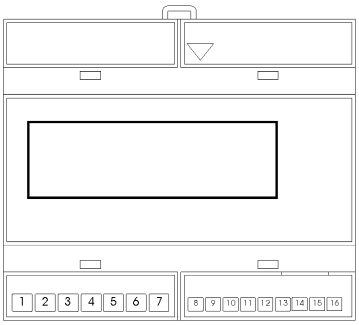
- **L’instrument ne s’allume pas…**
  - Vérifier que les cordons d’alimentation aient été correctement branchés
  - Vérifier la présence du courant électrique
- **L’afficheur ne s’illumine pas…**
  - Régler le contraste d’illumination de l’afficheur
- **La mesure chimique ne fonctionne pas…**
  - Vérifier la connexion de la sonde
  - Effectuer le calibrage comme il est mentionné dans le manuel
  - Remplacer la sonde
- **La sortie mA ne varie pas…**
  - Vérifier le branchement des cordons
  - Au travers du Menu Principal « Contrôle Manuel » vérifier que la sortie produise l’effet désiré
  - Contrôler les caractéristiques électriques du dispositif à distance (Charge maximale 500 ohm)
- **Les relais ne fonctionnent pas…**
  - Vérifier que l’instrument soit alimenté correctement
  - Vérifier les configurations dans le menu principal
- **La tension sur la porte Vcc In ne bloque pas l’instrument…**
  - Vérifier les branchements électriques
  - Vérifier que le générateur à distance fonctionne

Remarque : En cas d’anomalie persistante, contacter le fournisseur.

4.1 Tableau Affichage alarmes :

Alarme	Affichage	Etat relais	Que faire	Priorité
Hold	ALR Hold	RL1 et RL2 désactivés	Eliminer signal sur l’entrée tension Hold	1
OFA pré-alarme Temps > 70%	OFA ALR	RL2 Fermé	- Appuyer sur enter pour éliminer l’alarme - Vérifier l’installation	2
OFA Alarme Temps =100%	OFA Stop	RL2 Fermé	- Appuyer sur enter pour éliminer l’alarme - Vérifier l’installation	3
Bande d’Alarme mesure	Bande ALR	RL2 Fermé	- Appuyer sur enter pour mise sous silence relais 2 - Vérifier l’installation	4

Strumento per la misura del pH o Redox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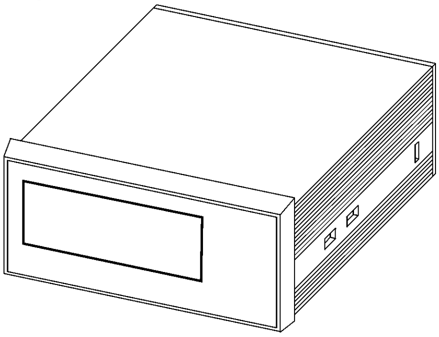
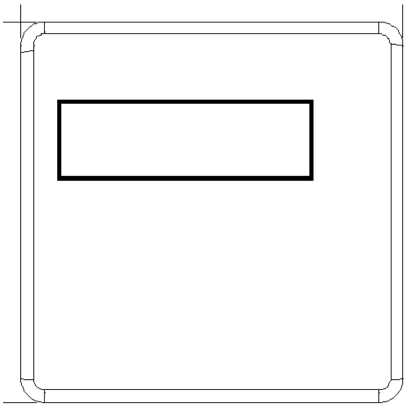
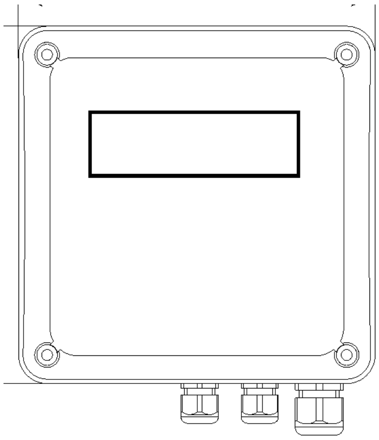






INDICE

1 Prima di tutto pag 2
2 Installazione pag 3
3 Impostazioni e funzionamento pag 5
4 Guida alla soluzione dei problemi pag 11

1 PRIMA DI TUTTO

1.1 BENVENUTO

➲ Si prega di leggere attentamente il presente manuale, facendo particolare attenzione ad avvertenze e precauzioni. Seguire sempre le necessarie procedure di sicurezza, incluso l'impiego di adeguate protezioni per viso, occhi e abbigliamento.

1.2 IL CONTENUTO NELLA CONFEZIONE

- Strumento di misura
- Supporti di fissaggio
- Manuale Istruzione

1.3 CARATTERISTICHE TECNICHE

Campo di misura chimica: 0÷14.0 pH o ±1500 mV per il Redox
Accuratezza: 1% FS pH o 1% FS Redox

Impedenza ingresso misura chimica: 1 x 10^{13} oHm
Connessione sonda misura chimica: BNC.
Calibrazione sonde: Assistito via Software

Campo di misura temperatura: da 0 a +100 °C (Risoluzione 1 °C)
Compensazione automatica della temperatura da 0 a 100 °C tramite sensore PT100 o impostazione manuale sullo strumento.

Uscita relay: Numero 2 Set Point (carico max 10 A 250 Vac resistivo)

Uscite in Corrente: Numero 1 (carico max 500 ohm) [Accuratezza ±2% F.S.]

Ingresso: 15÷30 Vac/dc

Alimentazione: 90÷265 Vac 50/60 Hz
Assorbimento: 5VA Max
Fusibile: 500 mA (ritardato)

Display: LCD 2 line 16 caratteri
Tastiera: Numero 4 tasti

Dimensioni meccaniche: Din Rail quadro; 48x96x98 mm quadro, 96x96 quadro, 144x144 parete.
Grado di protezione: IP40 entrambi i modelli

1.4 AVVERTENZE

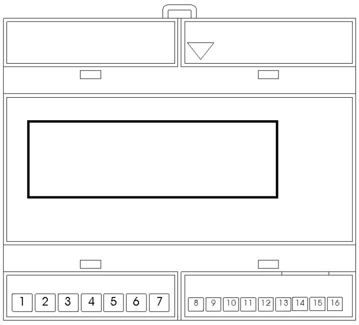
✋ Leggere attentamente questo manuale prima di procedere all'installazione e messa in funzione del sistema.
✋ Il gruppo di dosaggio deve essere connesso alla tensione d'alimentazione mediante un dispositivo di interruzione omnipolare con distanza di apertura maggiore uguale a 3mm.
✋Verificare il modello di apparecchiatura acquistata per i riferimenti di installazione settaggio e programmazione contenuti in questo manuale.
✋Per tutti I collegamenti fare riferimento alla mappa topografica del circuito di controllo riportata in questo manuale.
☠ ATTENZIONE: Seguire sempre le necessarie procedure di sicurezza, compreso l'uso di protezione adeguata di occhi, viso, mani ed indumenti.
☠ ATTENZIONE: Durante l'installazione o la manutenzione di questa apparecchiatura, scollegare sempre l'alimentazione.
➲ L'azienda lavora costantemente al perfezionamento di tutti i prodotti, riservandosi la facoltà di apportare modifiche in qualunque momento e senza preavviso alcuno.
➲ Il non rispetto delle norme contenute in questo manuale, potrebbe danneggiare cose o persone, compromettere il funzionamento o danneggiare l'apparecchiatura.

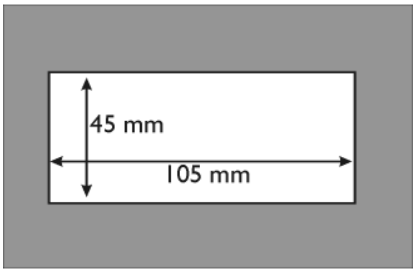
1.5 MATERIALE NECESSARIO PER L'INSTALLAZIONE

Munirsi di attrezzatura per fissare lo strumento

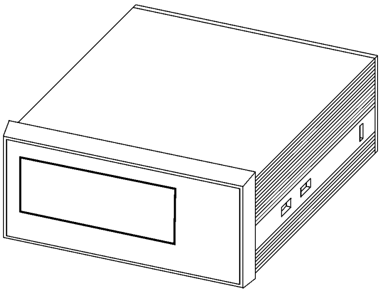
2 INSTALLAZIONE Meccanica ed Elettrica

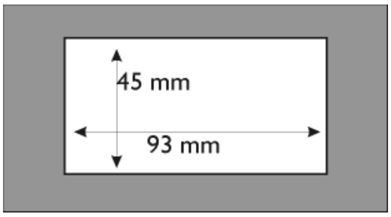
2.1.___Versione Din Rail (6 moduli Din EN50022)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

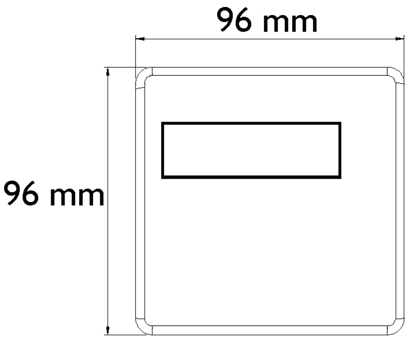


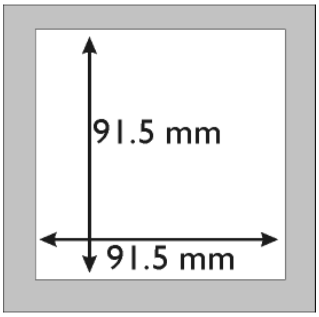
2.2___Versione 48x96x100



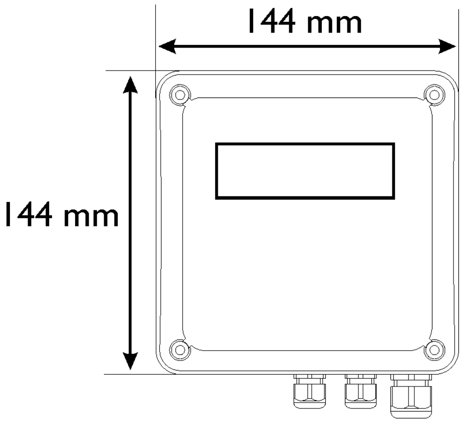


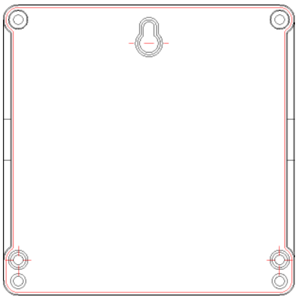
2.3___Versione 96x96x92

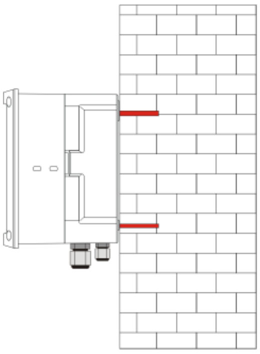



91.5 mm
91.5 mm

2.4__Versione 144x144x90


144 mm
144 mm



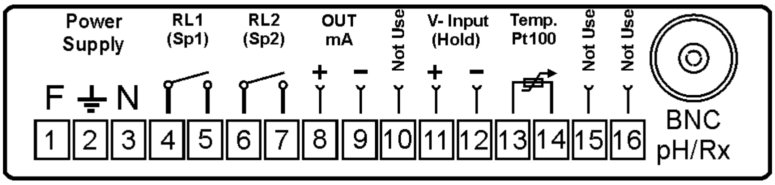


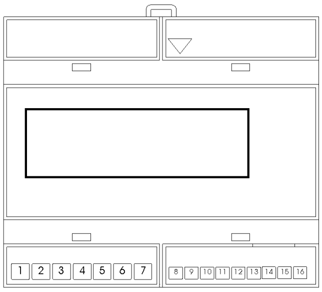
2.5 Descrizione connessioni elettriche

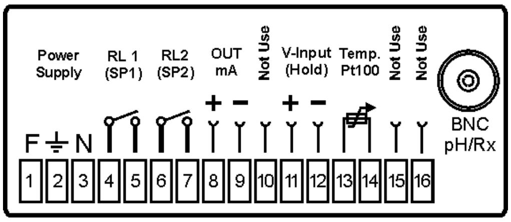
2.5.1__Tabella connessioni elettriche

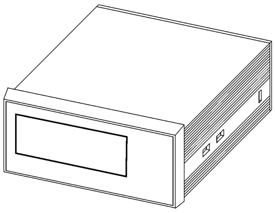
Morsetto	Descrizione
1	Fase (Alim.230 Vac
2	Terra
3	Neutro (Alim. 230Vac)
4-5	Relais SetPoint 1
6-7	Relais SetPoint 2
8-9	Uscita in corrente 0/4÷20 mA
10	Non utilizzato
11-12	Ingresso VDC 15÷30 Vdc **Hold**
13-14	Ingresso Sonda Temperatura
15-16	Non usato
BNC	Ingresso sonda pH/Redox

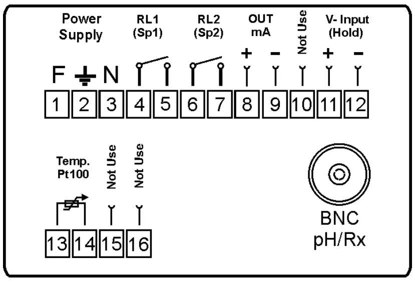
2.5.2__Etichetta connessioni elettriche per ogni modello

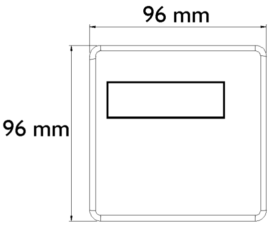

Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx

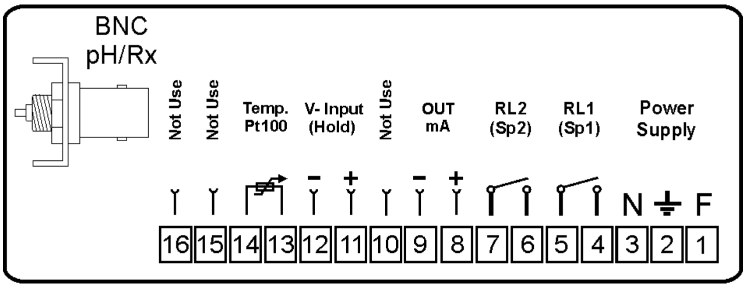

1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16

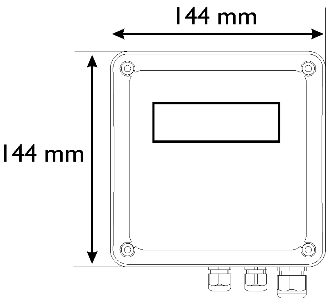

Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx




Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
F N
+ −
+ −
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx




BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

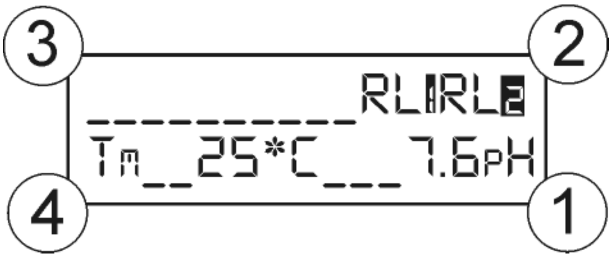

144 mm
144 mm

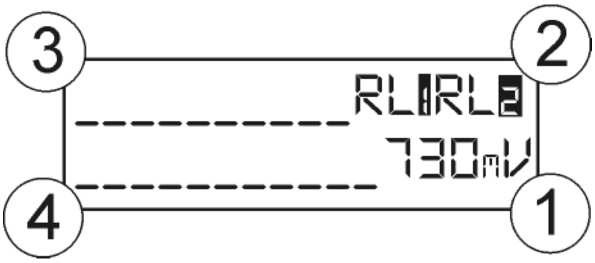
2.6 CONNESSIONI IDRAULICHE

Nessuna

3.0___IMPOSTAZIONI E FUNZIONAMENTO

3.1__Visualizzazione Strumento





Area 1 = Visualizzazione misura chimica pH o Redox
Area 2 = Visualizzazione stato Relè 1 e 2, se il numero del relè lampeggia il contatto è cambiato di stato
Area 3 = Visualizzazione degli allarmi
Area 4 = Visualizzazione temperatura manuale o automatica per il misura pH; sulla versione Redox area vuota
Nota: l'icona RL2 si trasforma in RLA quando il Set Point 2 si imposta con funzione Allarme.

3.2__Tastiera strumento

Esc/Mode = Tasto con doppia funzione **Esc** = Uscita immediata dal menù **Mode**= menu regolazioni veloci
Enter/ Cal = Tasto con doppia funzione **Enter** = Conferma funzione **Cal** = Accesso immediato calibrazione
Su = Tasto incremento
Giù = Tasto decremento

Funzione Calibrazione sonda *(Premere il tasto **Cal** per 3 secondi [premere Esc per uscire])*

- *Calibrazione sonda pH*
  - Immergere la sonda nella soluzione 7 pH e premere enter
  - Attendere 60 secondi autocalibrazione al termine visualizza la bontà della sonda in gradi percentuali.
  - Immergere la sonda nella soluzione 4 pH o 9.22 pH e premere enter
  - Attendere 60 secondi autocalibrazione al termine visualizza la bontà della sonda in gradi percentuali.
- *Calibrazione sonda Redox*
  - Immergere la sonda nella soluzione 465 mV e premere enter
  - Attendere 60 secondi autocalibrazione al termine visualizza la bontà della sonda in gradi percentuali.

Funzione Mode (menù veloce) *(Premere il tasto **Mode** per 1 secondi selezionare con tasto su e giu)*

- Setpoint 1   7.4pH (Premere il tasto Enter e regolare il valore con tasto su e giù)
- Setpoint 2   7.4pH (Premere il tasto Enter e regolare il valore con tasto su e giù)
- Relè 1 (Premere il tasto Enter per cambiare stato al relè)
- Relè 2 (Premere il tasto Enter per cambiare stato al relè)

Nota: dopo 10 secondi lo strumento esce in modo automatico

Funzione menù Impostazione valori *(Premere i tasti **Enter** ed **Esc** per 5 secondi)*

- Lingua (Impostare la lingua di visualizzazione menu)
  - Disponibile in Inglese (UK), Francese (FR), Spagnolo (ES), Tedesco (DE), Italiano (IT)
- Setpoint 1 (Impostare le funzioni di dosaggio o controllo tramite relè 1)
- Setpoint 2 (Impostare le funzioni di dosaggio o controllo tramite relè 2)
- Temperatura (Menù disponibile solo per misura pH)
- Output mA (Impostare uscita in corrente)
- Avanzato (menù di gestione tecnica)

Funzione di ripristino parametri di Fabbrica

- Spegnere lo strumento
- Premere Tasti **Su** e **Giù** insieme ed accendere lo strumento
- Lo strumento visualizza init._Default selezionare con i tasti Su o Giù Yes e premere Enter
- Lo strumento ricarica tutti i parametri di Fabbrica

Nota: Per uscire dai menù premere **esc**

3.3__IMPOSTAZIONI GENERALI

Pressione tasti **Enter e Esc** contemporaneamente Programmazione Valori:

Menu Programmazione (Parametri di fabbrica)	
Lingua	
Impostazione lingua	UK
Set point 1	
Valore Set point	7,4 pH
Tipo dosaggi	Acido
Banda Proporzionale	0.4 pH
Isteresi	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Set point 2 (Selezionabile Dosaggio o Allarme Set Point 1 vedi menù avanzato)	
Valore Set point	7.4 pH
Tipo dosaggi	Acido
Banda Proporzionale	0.4 pH
Isteresi	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Temperatura (*)	
Unità di misura	°C
Valore Manuale	25 °C
Output mA	
Range 0/4÷20 mA	4÷20 mA
Valore per 0 / 4 mA	Valore 0 pH
Valore per 20 mA	Valore 14 pH
Avanzato	
Seleziona misura pH/Redox	pH
Set point 2 Dosaggio o Allarme	Dosaggio
Ingresso Hold Abilitato o disabilitato	Disabilitato = ON
Calibrazione Abilitata o disabilitata	Abilitato = ON
Statistiche	
Numero Allarmi misura	0
Numero Azionamenti RL1	0
Numero Azionamenti RL2	0
Numero segnali ingresso Hold	0
Reset Statistiche	
Pannello di Controllo	
Contatto Relay 1 Normalmente Aperto o Chiuso	Normalmente aperto
Contatto Relay 2 Normalmente Aperto o Chiuso	Normalmente aperto
Uscita in corrente valore manuale	Generatore di corrente 0÷20 mA
Segnale sonda in ingresso in mV	Visualizza il segnale in mV
Segnale Hold presente	Segnale presente ON; assente OFF
Calibrazione sonda temperatura (**)	Impostare valore di correzione
Valore Offset calibrazione	Offset in % ultima calibrazione
Valore Gain calibrazione (*)	Gain in % ultima calibrazione
Revisione Firmware	X.X
Reset Strumento	Ripristina i valori di fabbrica
Password	0000

*menù presente solo con misura pH

** menù presente solo con sonda di temperatura installata

3.3__Impostazioni dettagliate menù programmazione

Premere i tasti Enter ed Esc insieme per 5 secondi, in questo modo si esegue il menù di programmazione dello strumento.

Lingua menù: impostare la lingua desiderata, è possibile selezionare tra:

- Italiano
- Inglese
- Francese
- Spagnolo
- Tedesco

Setpoint 1 menù: impostare i parametri di dosaggio tutte le regolazioni saranno azionate dal Relè 1
Il menù è composto dalle seguenti voci

Voce	Default	Limiti
Valore Set point	7,4 pH /750 mV	0÷14 pH / ±1500 mV
Tipo dosaggi	Acido / Basso	Acido o Alcalino /Alto o Basso
Banda Proporzionale	0,4 pH / 40 mV	0,4÷3 pH / 40÷300 mV
Isteresi	0,0 pH; 0 mV	0÷3 pH / 0÷300 mV
Timer ON	OFF	OFF…1÷480 minuti
Timer OFF	OFF	OFF…1÷480 minuti
Delay Start	OFF	OFF…3÷960 Secondi
Delay End	OFF	OFF…3÷960 Secondi

Setpoint 2 menù: impostare i parametri di dosaggio tutte le regolazioni saranno azionate dal Relè 2
Il menù è composto dalle stesse voci del Setpoint 1 se utilizzato con la funzione **SETPOINT 2= Dosaggio** (vedi menù Avanzato pag.8).

Se impostiamo la funzione **SETPOINT 2= ALLARME** (vedi menù **Avanzato** pag 8), possiamo utilizzare il Relè 2 come allarme di misura legato al Set poit 1 di conseguenza il menù si modifica come segue:

Voce	Default	Limiti
Banda allarme SetPoint 1	3 pH; 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (over feed alarm SetPoint 1)	OFF	OFF÷960 minutes

Temperatura menu: impostare il valore di temperatura per la compensazione automatica della misura pH è possibile impostare anche la unità di misura.

Voce	Default	Limiti
Unità di misura	°C	°C; °F
Valore Manuale	25 °C	0÷100 °C; 32÷212 °F

Uscita in corrente: impostare la scala e i valori dell’uscita in corrente

Voce	Default	Limiti
Scala 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Valore 0/4 mA (*)	0 pH; -1500 mV	0÷14 pH; ±1500 mV
Valore 20 mA (*)	14 pH; + 1500 mV	0÷14 pH; ±1500 mV

(* Nelle voci indicate si può impostare il valore opposto della scala in questo modo possiamo ottenere l’inversione della rampa 20 ÷ 4/0 mV)

Avanzato menù: Tramite le seguenti voci possiamo modificare le funzioni dello strumento e controllare ogni funzione; il menù è riservato ad un personale tecnico specializzato.

Voce	Default	Limiti
Seleziona misura pH/Redox	pH	pH; Redox
Set point 2 Dosaggio o Allarme	Dosaggio	Dosaggio o Allarme SP1
Ingresso Hold Abilitato o disabilitato	ON	OFF= Disabilitato; ON= Abilitato
Calibrazione Abilitata o disabilitata	ON	OFF= Disabilitato; ON= Abilitato

Con il seguente menù *Statistiche* è possibile verificare quanti azionamenti o variazioni abbiamo avuto nello strumento,

Statistiche	
Numero Allarmi misura	0
Numero Azionamenti RL1	0
Numero Azionamenti RL2	0
Numero segnali ingresso Hold	0
Reset Statistiche	

Con il seguente menù *Pannello di controllo* è possibile impostare e verificare manualmente ogni azione d’ingresso ed uscita presente nello strumento per facilitare l’installatore in fase di collaudo sull’impianto.

Pannello di Controllo	
Contatto Relay 1 Normalmente Aperto o Chiuso	Normalmente aperto
Contatto Relay 2 Normalmente Aperto o Chiuso	Normalmente aperto
Uscita in corrente valore manuale	Generatore di corrente 0÷20 mA
Segnale sonda in ingresso in mV	Visualizza il segnale della sonda in mV
Segnale Hold presente	Segnale presente ON; assente OFF
Calibrazione sonda temperatura (**)	Impostare valore di correzione
Valore Offset calibrazione	Offset in % ultima calibrazione
Valore Gain calibrazione (*)	Gain in % ultima calibrazione
Revisione Firmware	X.X

*menù presente solo con misura pH

** menù presente solo con sonda di temperatura installata

Nota: Nel Menù *Pannello di Controllo* lo strumento non esce in modo automatico in quanto consente all’installatore di lavorare in manuale per uscire premere il tasto ESC.

Con il seguente menù *Reset Strumento* è possibile ripristinare tutti i parametri di Fabbrica ed esce automaticamente dal menù impostazioni. I parametri di fabbrica sono riportati a pagina 6

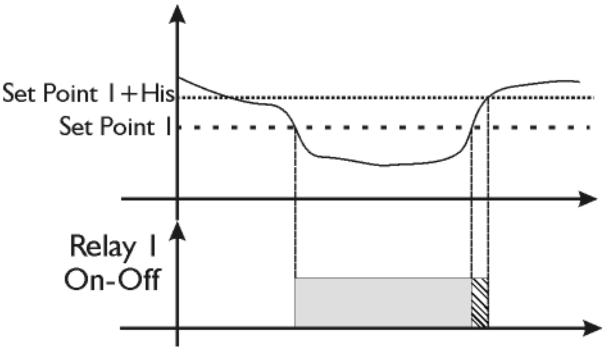
Reset Strumento	Ripristina i valori di fabbrica

Con il seguente menù *Password* è possibile proteggere il menù impostazione da personale non autorizzato, la Password standard è 0000. Nel caso di smarrimento o dimenticanza della Password impostata eseguire il menù nascosto riportato a pagina 5 per ripristinare i parametri di Default.

Password	0000

3.4__Esempi di dosaggio e regolazione

Dosaggio Pausa/Lavoro (ON-OFF)

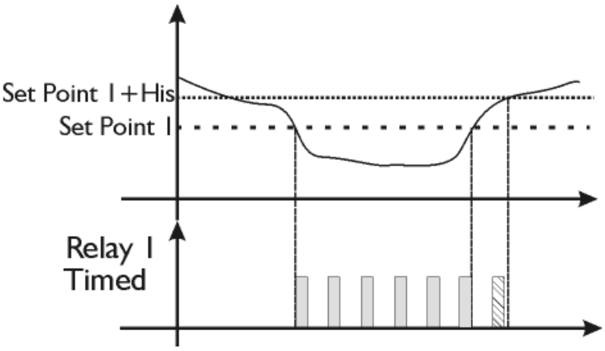


Lo strumento consente di controllare e modificare la misura chimica tramite il Set Point 1 in automatico; regolando il dosaggio tramite il relè 1 comandato in Pausa/Lavoro.
Impostando i seguenti parametri si ottiene il dosaggio riportato qui di fianco:

- Set point 1 = 7.20 pH
- Tipo Dosaggio = Alcalino
- Banda Proporzionale = OFF
- Isteresi = 0.40
- Timer On = OFF
- Timer OFF = OFF

Lo strumento inizierà il dosaggio per valori inferiori di 7,20 e terminerà il dosaggio per valore superiori a 7,60; modificando la Voce Tipo di dosaggio con Acido il dosaggio sarà esattamente opposto, inizierà il dosaggio superato 7,20 e terminerà per un valore inferiore a 6,80 pH. Lo strumento consente di eseguire due dosaggi in modo indipendente impostando il Set point 2 a cui è associato il relè 2.

Dosaggio Temporizzato (Timed)

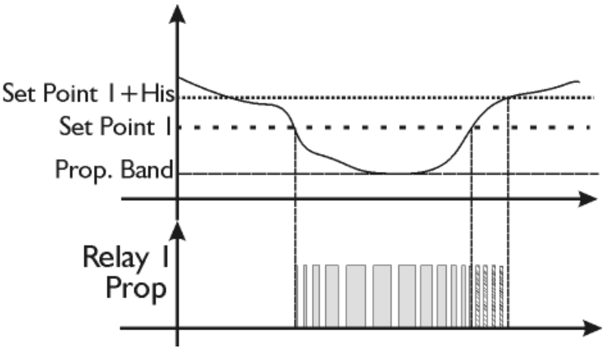


Lo strumento consente di controllare e modificare la misura chimica tramite il Set Point 1 in automatico; regolando il dosaggio tramite il relè 1 comandato in Tempi Fissi.
Impostando i seguenti parametri si ottiene il dosaggio riportato qui di fianco:

- Set point 1 = 7.20 pH
- Tipo Dosaggio = Alcalino
- Banda Proporzionale = OFF
- Isteresi = 0.40
- Timer On = 5 minuti
- Timer OFF = 10 minuti

Lo strumento inizierà il dosaggio temporizzato per valori inferiori di 7,20 e terminerà il dosaggio per valore superiori a 7,60; modificando la Voce Tipo di dosaggio con Acido il dosaggio sarà esattamente opposto, inizierà il dosaggio superato 7,20 e terminerà per un valore inferiore a 6,80 pH. Lo strumento consente di eseguire due dosaggi in modo indipendente impostando il Set point 2 a cui è associato il relè 2.

Dosaggio Proporzionale (Prop)



Lo strumento consente di controllare e modificare la misura chimica tramite il Set Point 1 in automatico; regolando il dosaggio tramite il relè 1 comandato in Tempo Proporzionale.
Impostando i seguenti parametri si ottiene il dosaggio riportato qui di fianco:

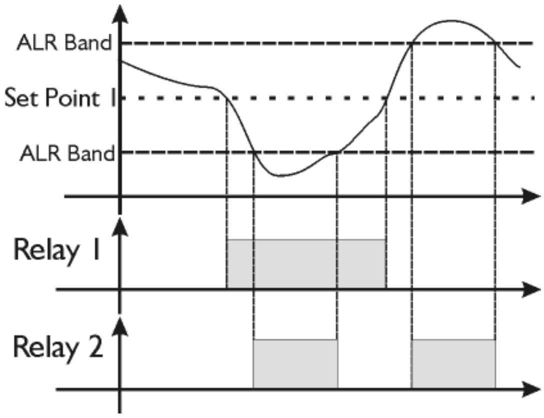
- Set point 1 = 7.20 pH
- Tipo Dosaggio = Alcalino
- Banda Proporzionale = 0,40 pH
- Isteresi = 0.40
- Timer On = 10 minuti (*)
- Timer OFF = 10 minuti (*)

Lo strumento inizierà il dosaggio proporzionale per valori inferiori di 7,20 e terminerà il dosaggio per valore superiori a 7,60; modificando la Voce Tipo di dosaggio con Acido il dosaggio sarà esattamente opposto, inizierà il dosaggio superato 7,20 e terminerà per un valore inferiore a 6,80 pH. Lo strumento consente di eseguire due dosaggi in modo indipendente impostando il Set point 2 a cui è associato il relè 2.

(* impostando tempi uguali nelle variabili *Timer ON e OFF* lo strumento calcola un periodo totale che modifica in automatico rispetto alla variazione della misura chimica nella banda di isteresi dosa al valore minimo)

Nota: Tutte le impostazioni di regolazione e dosaggio sono valide anche per la misura Redox.

Relè 2 usato come allarme per il Set Point 1



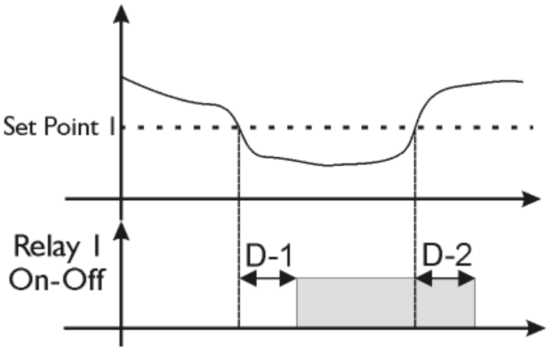
Impostando la Banda allarme si crea una finestra di lavoro oltrepassando i limiti consentiti si chiude il relè 2 e rimane chiuso fino al ripristino misura oppure premere il tasto enter per disattivare l'allarme.

Impostando il tempo OFA (over feed Alarm) si controlla il dosaggio del Set Point 1 in tempo suddiviso in due allarmi:

- Primo allarme al 70% del tempo impostato si visualizza sul display e il relè 2 si chiude.
- Secondo allarme al 100% del tempo impostato si visualizza sul display e si chiude il relè 2.

Eliminare l'allarme premendo il tasto Enter.
Nota: l'icona RL2 si trasforma in RLA

Dosaggio con tempi di ritardo



Lo strumento consente di ritardare in tempo l'inizio e la fine del dosaggio. Impostando i seguenti parametri si ottiene il dosaggio riportato qui di fianco:

- Delay Start (D-1) = 5 minuti
- Delay End (D-2) = 5 minuti

Questa funzione è disponibile in tutte le regolazioni descritte in precedenza ON-OFF, Timed, Prop.

Nota: Le variabili sopra riportate sono presenti sia sul Sep Point 1 sia sul Set Point 2 in modo idipendente.

4 GUIDA ALLA SOLUZIONE DEI PROBLEMI

- **Non si accende…**
  - Verificare se sono stati collegati correttamente i cavi di alimentazione
  - Verificare se è presente l’alimentazione di rete
- **Non si illumina il display…**
  - Regolare il contrasto di illuminazione display
- **La misura chimica non funziona…**
  - Verificare la connessione della sonda
  - Eseguire la calibrazione come riportato nel manuale
  - Sostituire la sonda
- **L’uscita mA non varia…**
  - Verificare la connessione cavi
  - Verificare tramite il Menù Principale “Controllo Manuele” se l’uscita produce l’effetto desiderato.
  - Controllare le caratteristiche elettriche del dispositivo remoto (Massimo carico 500 ohm)
- **I relais non funzionano…**
  - Verificare se lo strumento è alimentato correttamente
  - Verificare le impostazioni nel menù principale
- **La tensione sulla porta Vdc In non blocca lo strumento…**
  - Verificare le connessioni elettriche
  - Verificare se il generatore remoto sia funzionante.

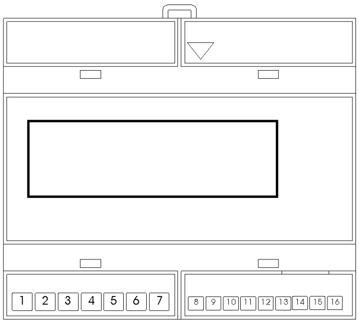
Nota: Nel caso di anomalia persistente contattare il fornitore.

4.1 Tabella Visualizzazione allarmi:

Allarme	Visualizzazione	Stato relè	Case da fare	Priorità
Hold	ALR Hold	RL1 e RL2 disabilitati	Eliminare segnale sull’ingresso tensione Hold	1
OFA pre-allarme Tempo > 70%	OFA ALR	RL2 Chiuso	- Premere enter per eliminare l’allarme - Verificare l’impianto	2
OFA Allarme Tempo =100%	OFA Stop	RL2 Chiuso	- Premere enter per eliminare l’allarme - Verificare l’impianto	3
Banda di Allarme misura	Banda ALR	RL2 Chiuso	- Premere enter per silenziamento relè 2 - Verificare impianto	4

PR-40

Equipamento para a medida do pH ou Redox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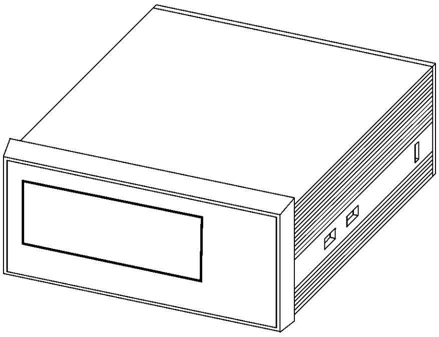
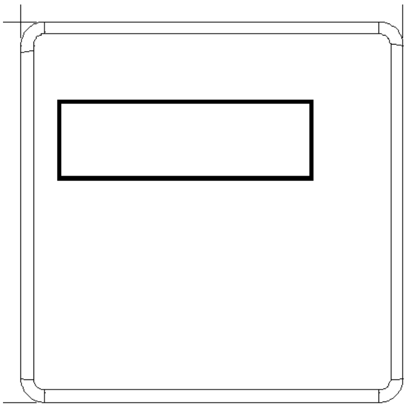
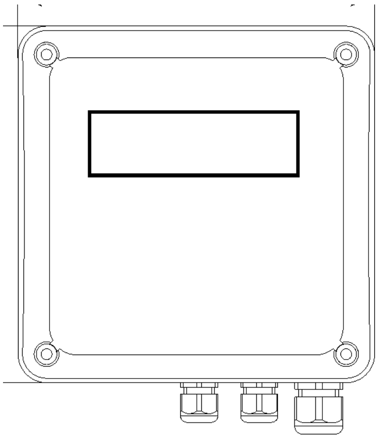






ÍNDICE

1 Antes de tudo pag 2
2 Instalação pag 3
3 Seleções e funcionamento pag 5
4 Guia para solução dos problemas pag 11

1 ANTES DE TUDO

1.1 BENVINDO

➲ Solicitamos ler atentamente o presente manual, prestando particular atenção a advertências e precauções. Seguir sempre os necessários procedimentos de segurança, inclusive o emprego de adequadas proteções para rosto, olhos e indumentária.

1.2 O CONTEÚDO DA EMBALAGEM

- Equipamento de Medição
- Suportes de fixação
- Manual de Instrução

1.3 CARACTERÍSTICAS TÉCNICAS

Campo de medida química: 0÷14.0 pH ou ±1500 mV para o Redox
Precisão: 1% FS pH ou 1% FS Redox

Impedância de entrada da medida química: 1 x 10^{13} oHm
Conexão da sonda de medida química: BNC.
Calibração das sondas: Assistido por Software

Campo de medida de temperatura: de 0 a +100 °C (Resolução de 1 °C)
Compensação automática da temperatura de 0 a 100 °C através de sensor PT100 ou seleção manual no equipamento.

Relê de saída: Número 2 Set Point (carga máx 10 A 250 Vac resistivo)

Saídas em Corrente: Número 1 (carga máx 500 ohm) [Precisão ±2% F.S.]

Entrada: 15÷30 Vac/dc

Alimentação: 90÷265 Vac 50/60 Hz
Absorção: 5VA Max
Fusível: 500 mA (retardado)

Display: LCD 2 line 16 caracteres
Teclado: Número de 4 teclas

Dimensões mecânicas: quadro Din Rail ; 48x96x98 mm quadro, 96x96 quadro, 144x144 parede.
Grau de proteção: IP40 em ambos os modelos.

1.4 ADVERTÊNCIAS

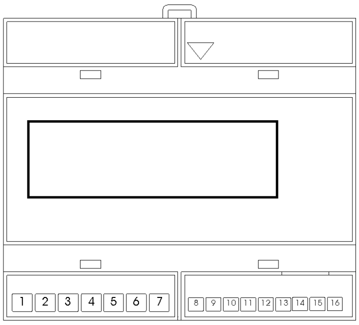
✋ Ler atentamente este manual antes de proceder à instalação e colocação em funcionamento do sistema.
✋ O grupo de dosagem deve ser conectado à tensão de alimentação mediante um dispositivo de interrupção unipolar com distância de abertura maior igual a 3mm.
✋ Verificar o modelo de aparelhagem adquirida para as referências de instalação, ajustes e programação contidos neste manual.
✋ Para todas as conexões fazer referência ao mapa topográfico do circuito de controle referido neste manual.
☠ ATENÇÃO: Seguir sempre os necessários procedimentos de segurança, inclusive o uso de proteção adequada de olhos, rosto, mãos e indumentária. EPIs.
☠ ATENÇÃO: Durante a instalação ou a manutenção desta aparelhagem, desconectar sempre a alimentação de energia elétrica.
➲ A Empresa trabalha constantemente no aperfeiçoamento de todos os produtos, reservando-se a faculdade de aportar modificações em qualquer momento e sem previo aviso .
➲ A inobservância das normas contidas neste manual, pode danificar coisas ou pessoas, comprometer o funcionamento ou danificar o equipamento.

1.5 MATERIAL NECESSÁRIO À INSTALAÇÃO

Munir-se de ferramentas para fixar o equipamento

2 INSTALAÇÃO Mecânica e Elétrica

2.1.- Versão Din Rail (6 módulos Din EN50022)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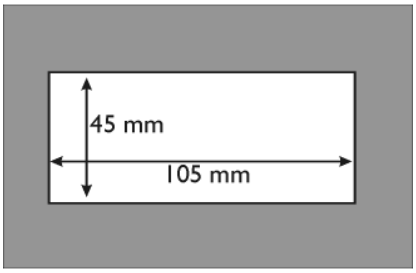
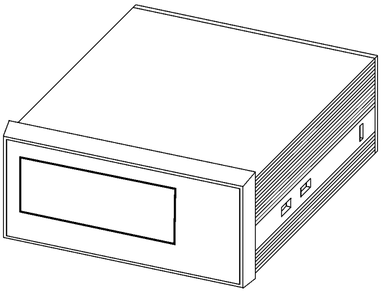
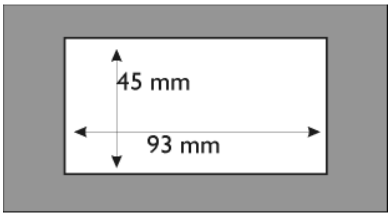
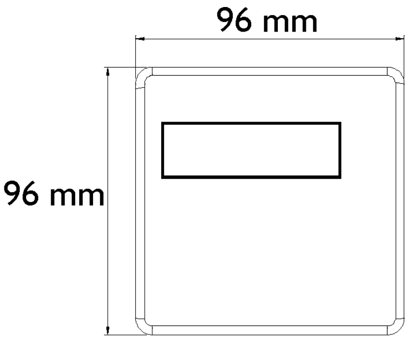


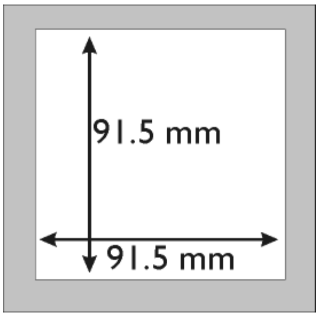
2.2.- Versão 48x96x100



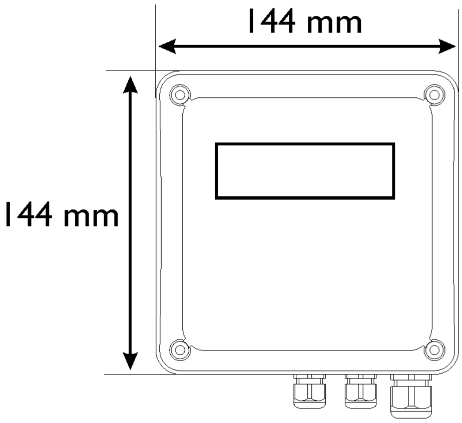


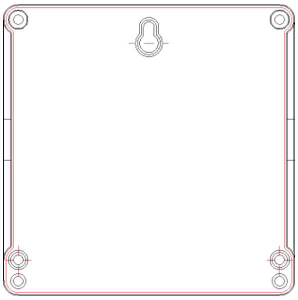
2.3.- Versão 96x96x92

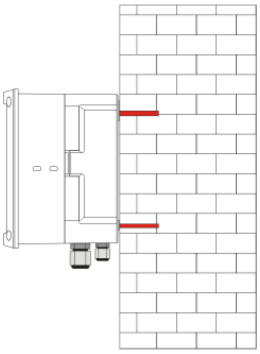



91.5 mm
91.5 mm

2.4.- Versão 144x144x90


144 mm
144 mm



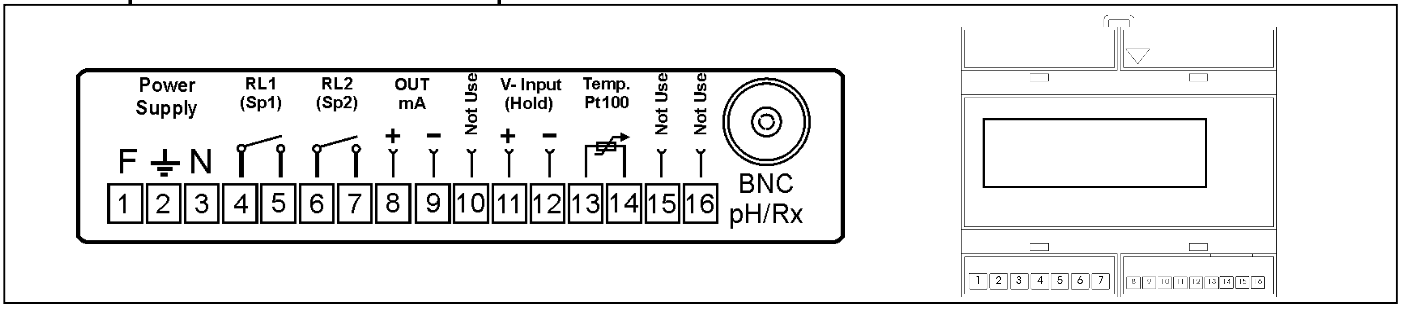


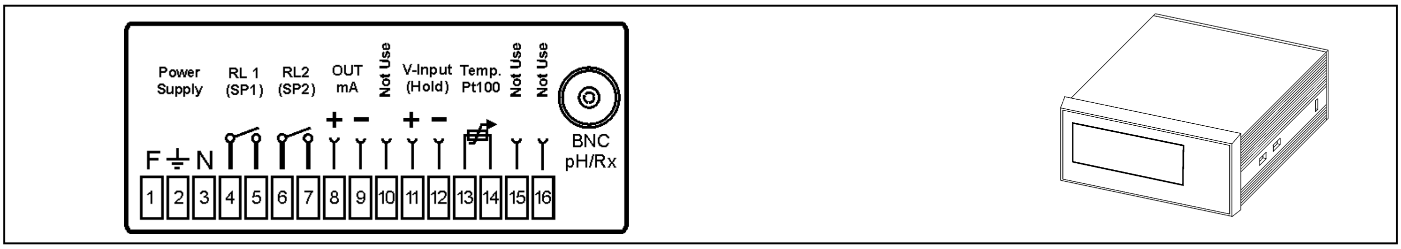
2.5.- Descrição das conexões elétricas

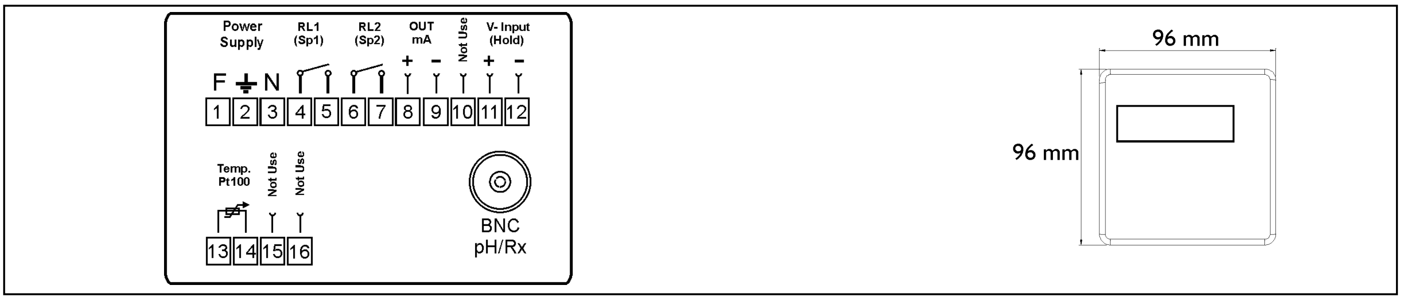
2.5.1.- Tabela das conexões elétricas

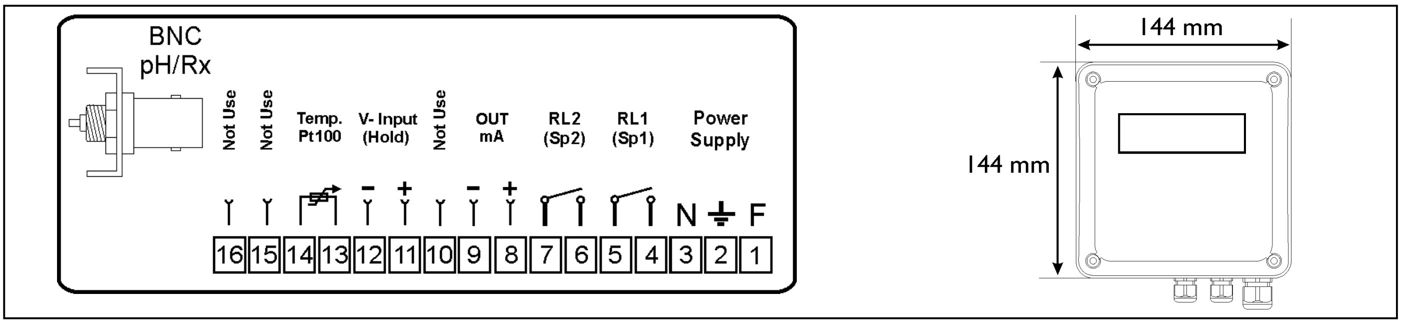
Terminal	Descrição
1	Fase (Alim.230 Vac
2	Terra
3	Neutro (Alim. 230Vac)
4-5	Relê SetPoint 1
6-7	Relê SetPoint 2
8-9	Saída em corrente 0/4÷20 mA
10	Não utilizado
11-12	Entrada VDC 15÷30 Vdc **Hold**
13-14	Entrada de Sonda Temperatura
15-16	Não usado
BNC	Entrada de sonda pH/Redox

2.5.2.- Etiqueta das conexões elétricas para cada modelo


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F ⏚ N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16


Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F ⏚ N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx


Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
+ −
+ −
F ⏚ N
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx
96 mm
96 mm

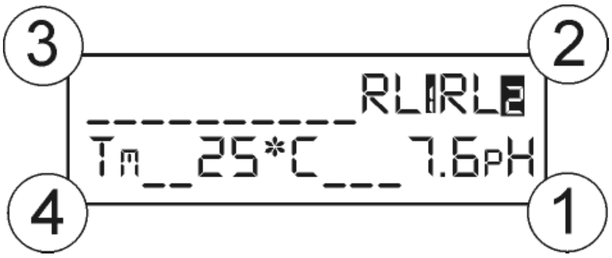

BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N ⏚ F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
144 mm
144 mm

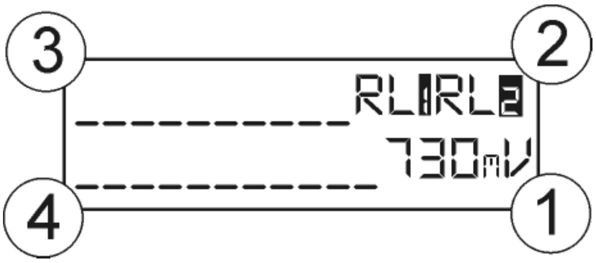
2.6 CONEXÕES HIDRÁULICAS

Nenhuma

3.0.- SELEÇÕES E FUNCIONAMENTO

3.1.- Visualização do equipamento





Área 1 = Visualização da medida química do pH ou Redox
Área 2 = Visualização do estado dos Relês 1 e 2, se o número do relê lampeja o contato mudou de estado
Área 3 = Visualização dos alarmes
Área 4 = Visualização da temperatura manual ou automática para a medida do pH; na versão Redox área vazia
Nota: O ícone RL2 se trasforma em RLA quando o Set Point 2 se seleciona com função de Alarme.

3.2.- Teclado do equipamento

Esc/Mode = Tecla com dupla função **Esc** = Saída imediata do menu
Mode = menu de regulagens rápidas
Enter/ Cal = Teclas com dupla função **Enter** = Confirma a função **Cal** = Acesso imediato á calibração
Para cima = Tecla de aumento
Para baixo = Tecla de redução

Função Calibração de sonda *(Pressionar a tecla **Cal** por 3 segundos [pressionar Esc para sair])*

- *Calibração da sonda de pH*
  - Imergir a sonda na solução 7 pH e pressionar enter
  - Esperar 60 segundos pela auto-calibração e ao término verificar a qualidade da sonda em graus percentuais.
  - Imergir a sonda na solução 4 pH ou 9.22 pH e pressionar enter
  - Esperar 60 segundos pela auto-calibração e ao término verificar a qualidade da sonda em graus percentuais.
- *Calibração da sonda Redox*
  - Imergir a sonda na solução 465 mV e pressionar enter
  - Esperar 60 segundos pela auto-calibração e ao término verificar a qualidade da sonda em graus percentuais.

Função Mode (menú rápido) *(Pressionar a tecla **Mode** por 1 segundos selecionar com tecla acima e abaixo)*

- Setpoint 1 7.4pH (Pressionar a tecla Enter e regular o valor com as teclas acima e abaixo)
- Setpoint 2 7.4pH (Pressionar a tecla Enter e regular o valor com as teclas acima e abaixo)
- Relê 1 (Pressionar a tecla Enter para mudar o estado do relê)
- Relê 2 (Pressionar a tecla Enter para mudar o estado do relê)

Nota: depois de10 segundos o equipamento sai de modo automático

Função menú Seleção de valores *(Pressionar as teclas **Enter** e **Esc** por 5 segundos)*

- Idioma: Selecionar o idioma de visualização no menu
  - Disponível em Inglês (UK), Francês (FR), Espanhol (ES), Alemão (DE), Italiano (IT)
- Setpoint 1 (Selecionar as funções de dosagem ou controle atravéz o relê 1)
- Setpoint 2 (Selecionar as funções de dosagem ou controle atravéz o relê 2)
- Temperatura (Menú disponível só para medida de pH)
- Output mA (Selecionar saída em corrente)
- Avançado (menú de gestão técnica)

Função de Restauração de Parâmetros de Fábrica

- Desligar o equipamento
- Pressionar as Teclas **Acima** e **Abaixo** juntas e ligar o equipamento
- O equipamento visualiza init._Default selecionar com as teclas acima ou abaixo Yes e pressionar Enter
- O erquipamento recarrega todos os parâmetros de Fábrica

Nota: Para sair dos menús pressionar **esc**

3.3.- SELEÇÕES GERAIS

Pressione as teclas **Enter e Esc** simultaneamente para Programação de Valores:

Menu de Programação (Parâmetros de fábrica)	
Idioma	
Seleção de Idioma	UK
Set point 1	
Valor de Set point	7,4 pH
Tipo de dosagens	Ácido
Banda Proporcional	0.4 pH
Hesterese	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Set point 2 (Selecionável: Dosagem ou Alarme Set Point 1 ver menú avançado)	
Valor de Set point	7.4 pH
Tipo de dosagem	Acido
Banda Proporcional	0.4 pH
Hesterese	0,0 pH
Timer ON	OFF
Timer OFF	OFF
Delay Start	OFF
Delay End	OFF
Temperatura (*)	
Unitdade de medida	°C
Valor Manual	25 °C
Output mA	
Range 0/4÷20 mA	4÷20 mA
Valor para 0 / 4 mA	Valor 0 pH
Valor para 20 mA	Valor 14 pH
Avançado	
Selecionar medida pH/Redox	pH
Set point 2 Dosagem ou Alarme	Dosagem
Entrada Hold Habilitada ou desabilitada	Desabilitada = ON
Calibração Habilitada ou desabilitada	Habilitada = ON
Estatísticas	
Número de Alarmes medida	0
Número de Acionamentos RL1	0
Número de Acionamentos RL2	0
Número de sinais de entrada Hold	0
Reset Estatísticas	
Painel de Controle	
Contato Relê 1 Normalmente Aberto ou Fechado	Normalmente aberto
Contato Relê 2 Normalmente Aberto ou Fechado	Normalmente aberto
Saida em corrente valor manual	Gerador de corrente 0÷20 mA
Sinal da sonda em entrada em mV	Visualiza o sinal em mV
Sinal Hold presente	Sinal presente ON; ausente OFF
Calibração de sonda de temperatura (**)	Selecionar valor de correção
Valor de Offset de calibração	Offset em % última calibração
Valor Gain calibração (*)	Gain em % última calibração
Revisão Firmware	X.X
Reset de equipamento	Restaura os valores de fábrica
Senha	0000

*menú presente só com medida de pH
** menú presente só com sonda de temperatura instalada

3.3.- Seleções Detalhadas de Programação de Menu

Pressionar as teclas Enter e Esc juntas por 5 segundos, deste modo se executa o menú de programação do equipamento.

Menu de Idioma : Selecionar o Idioma desejado, é possível selecionar entre:

Italiano
Inglês
Francês
Espanhol
Alemão

Menu de Setpoint 1 : selecionar os parâmetros de dosagem, todas as regulagens serão acionadas pelo Relê 1
O menù é composto pelos seguintes ítens

Ítem	Default	Limite
Valor de Set point	7,4 pH /750 mV	0÷14 pH / ±1500 mV
Tipo de dosagem	Ácido / Baixo	Ácido ou Alcalino /Alto ou Baixo
Banda Proporcional	0,4 pH / 40 mV	0,4÷3 pH / 40÷300 mV
Hesterese	0,0 pH; 0 mV	0÷3 pH / 0÷300 mV
Timer ON	OFF	OFF…1÷480 minutos
Timer OFF	OFF	OFF…1÷480 minutos
Delay Start	OFF	OFF…3÷960 Segundos
Delay End	OFF	OFF…3÷960 Segundos

Menu Setpoint 2 : Selecionar os parâmetros de dosagem, todas as regulagens serão acionadas pelo Relê 2
O menú é composto pelos mesmos ítens do Setpoint 1 se utilizado com a função **SETPOINT 2= Dosagem** (ver menú Avançado pag.8).

Se acionada a função **SETPOINT 2= ALARME** (ver menú **Avançado** pag 8), podemos utilizar o Relè 2 como alarme de medida ligado ao Set poit 1, como consequência o menú se modifica como segue:

Ítem	Default	Limites
Banda de alarme SetPoint 1	3 pH; 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (over feed alarm SetPoint 1)	OFF	OFF÷960 minutos

Menú de Temperatura : Selecionar o valor de temperatura para a compensação automática da medida do pH, é possível selecionar também a unidade de medida.

Ìtem	Default	Limites
Unidade de medida	°C	°C; °F
Valor Manual	25 °C	0÷100 °C; 32÷212 °F

Saída em Corrente: Selecionar a escala e os valores da saída em corrente

Ítem	Default	Limites
Escala 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Valor 0/4 mA (*)	0 pH; -1500 mV	0÷14 pH; ±1500 mV
Valor 20 mA (*)	14 pH; + 1500 mV	0÷14 pH; ±1500 mV

(* Nos ítens indicados se pode selecionar o valor oposto da escala, deste modo podemos obter a inverção da rampa 20 ÷ 4/0 mV)

Menu Avançado : Através dos seguintes itens podemos modificar as funções do equipamento e controlar cada função; o menu é reservado a um pessoal técnico especializado.

Ítem	Default	Limites
Selecionar medida pH/Redox	pH	pH; Redox
Set point 2 Dosagem ou Alarme	Dosagem	Dosagem ou Alarme SP1
Entrada Hold Habilitada ou desabilitada	ON	OFF= Desabilitada; ON= Habilitada
Calibração Habilitata ou desabilitada	ON	OFF= Desabilitada; ON= Habilitada

Com o seguinte menú Es*tatísticas* é possível verificar quantos acionamentos ou variações tivemos no equipamento,

Estatísticas	
Número de Alarmes de medida	0
Número de Acionamentos RL1	0
Número de Acionamentos RL2	0
Número de sinais de entrada Hold	0
Reset Estatísticas	

Com o seguinte menu *Painel de Controle* é possível selecionar e verificar manualmente cada ação de entrada e saída presente no equipamento para facilitar ao instalador na fase de teste da instalação.

Paniel de Controle	
Contato Relê 1 Normalmente Aberto ou fechado	Normalmente aberto
Contato Relê 2 Normalmente Aberto ou fechado	Normalmente aberto
Saida em corrente valor manual	Gerador de corrente 0÷20 mA
Sinal de sonda de entrada em mV	Visualiza o sinal da sonda em mV
Sinal Hold presente	Sinal presente ON; ausente OFF
Calibração de sonda de temperatura (**)	Selecionar o valor de correção
Valor de Offset calibração	Offset em % última calibração
Valor Gain calibração (*)	Gain em % última calibração
Revisão Firmware	X.X

*menú presente só com medida de pH

** menú presente só com sonda de temperatura instalada

Nota: No Menú *Painel de Controle* o equipamento não sai de modo automático enquanto permite ao instalador trabalhar manualmente, para sair pressionar a tecla ESC.

Com o seguinte menú *Reset equipamento* é possível restaurar todos os parâmetros de Fábrica e sair automaticamente do menú seleções. Os parâmetros de fábrica estão reportados na página 6

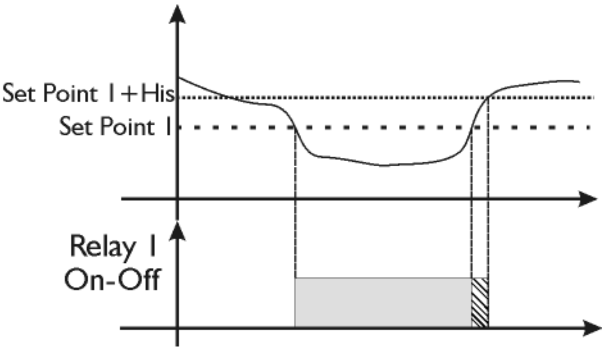
Reset do Equipamento	Restaura os valores de fábrica

Com o seguinte menú *Senha* é possível proteger o menú seleção de pessoal não autorizado, a Senha Padrão é 0000. No caso de perda ou esquecimento da Senha selecionada executar o menú oculto reportado na página 5, para restaurar os parâmetros de Default.

Senha	0000

3.4.- Exemplos de Dosagem e Regulagem

Dosagem Pausa/trabalho (ON-OFF)

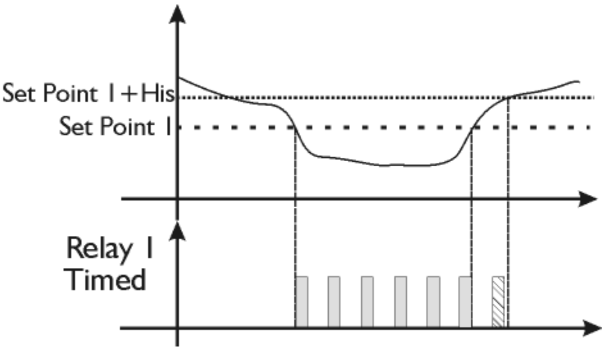


O equipamento permite controlar e modificar a medida química através do Set Point 1 no automático; regulando a dosagem através do relê 1 comandado como Pausa/trabalho.
Selecionando os seguintes parâmetros se obtem a dosagem reportada aqui ao lado:

- Set point 1 = 7.20 pH
- Tipo de Dosagem = Alcalina
- Banda Proporcional = OFF
- Hesterese = 0.40
- Timer On = OFF
- Timer OFF = OFF

O Equipamento iniciará a dosagem por valores inferiores a 7,20 e terminará a dosagem por valores superiores a 7,60; modificando o ítem Tipo de dosagem com Ácido a dosagem será exatamente o oposto, iniciará a dosagem superado os 7,20 e terminará por um valor inferior a 6,80 de pH. O Equipamento permite executar duas dosagens de modo independente selecionando o Set point 2 ao qual está associado o relê 2.

Dosagem Temporizada (Timed)

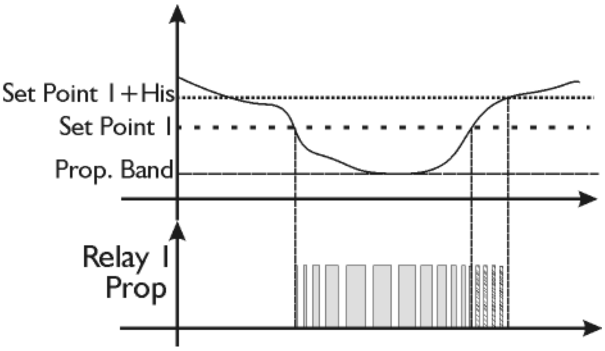


O Equipamento permite controlar e modificar a medida química através do Set Point 1 no automático; regulando a dosagem através do relê 1 comandado em Tempos Fixos.
Selecionando os seguintes parâmetros se obtem a dosagem reportada aqui ao lado:

- Set point 1 = 7.20 pH
- Tipo de Dosagem = Alcalina
- Banda Proporcional = OFF
- Hesterese = 0.40
- Timer On = 5 minutos
- Timer OFF = 10 minutos

O Equipamento inicirá a dosagem temporizada por valores inferiores a 7,20 e terminará a dosagem por valores superiores a 7,60; modificando o ítem Tipo de dosagem com Ácido, a dosagem será exatamente o oposto, iniciará a dosagem superados os 7,20 e terminará por um valor inferior a 6,80 de pH. O equipamento permite executar duas dosagens de modo indipendente selecionando o Set point 2 ao qual está associado o relê 2.

Dosagem Proporcional (Prop)



O Equipamento permite controlar e modificar a medida química através do Set Point 1 no automático; regulando a dosagem através do relê 1 comandado em Tempo Proporcional.
Selecionando os seguintes parâmetros se obtem a dosagem reportada aqui ao lado:

- Set point 1 = 7.20 pH
- Tipo de Dosagem = Alcalino
- Banda Proporcional = 0,40 pH
- Hesterese = 0.40
- Timer On = 10 minutos (*)
- Timer OFF = 10 minutos (*)

O equipamento iniciará a dosagem proporcional por valores inferiores a 7,20 e terminará a dosagem por valores superiores a 7,60; modificando o item Tipo de Dosagem com Ácido a dosagem será exatamente o oposto, iniciará a dosagem superados os 7,20 e terminará por um valor inferior a 6,80 de pH. O equipamento permite executar duas dosagens de modo indipendente selecionando o Set point 2 ao qual está associado o relê 2.

(* Selecionando tempos iguais nas variáveis *Timer ON e OFF* o equipamento calcula um periodo total que modifica automaticamente em relação à variação da medida química na banda de Hesterese dosa no valor mínimo)

Nota: Todas as seleções de regulagem e dosagens são válidas também para a medida Redox.

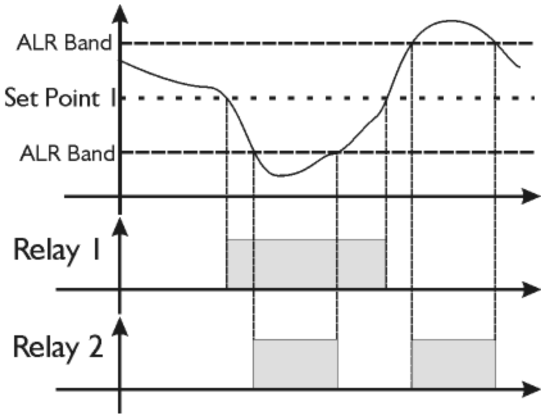
Relê usado como alarme para o Set Point 1

Selecionando a Banda alarme se cria uma janela de trabalho, ultrapassando os limites permitidos, se fecha o relê 2 e fica fechado até a restauração da medida ou ainda, pressionar a tecla enter para desativar o alarme.

Selecionando o tempo OFA (over feed Alarm) se controla a dosagem do Set Point 1 em tempo subdividido em dois alarmes:

- Primeiro alarme aos 70% do tempo selecionado visualiza-se no display e o relê 2 se fecha.
- Segundo alarme aos 100% do tempo selecionado visualiza-se no display e se fecha o relê 2.

Eliminar o alarme pressionando a tecla Enter.
Nota: o ícone RL2 se transforma em RLA



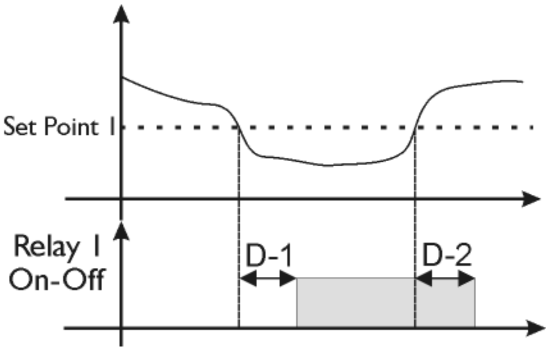
Dosagem com tempos de retardo

O equipamento permite retardar em tempo o inicio e o fim da dosagem. Selecionando os seguintes parâmetros se obtem a dosagem reportada aqui ao lado:

- Delay Start (D-1) = 5 minutos
- Delay End (D-2) = 5 minutos

Esta função está disponível em todas as regulagens descritas acima ON-OFF, Timed, Prop.

Nota: As variáveis acima reportadas estão presentes seja no Set Point 1 seja no Set Point 2 de modo independente.



4 GUIA PARA A SOLUÇÃO DOS PROBLEMAS

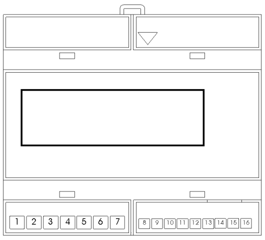
- **Não liga…**
    - Verificar se foram conectados corretamente os cabos de alimentação
    - Verificar se há alimentação de rede
- **Não se ilumina o display…**
    - Regular o contraste de iluminação do display
- **A medida química não funciona…**
    - Verificar a conexão da sonda
    - Executar a calibração como reportado no manual
    - Substituir a sonda
- **A saída mA não varia…**
    - Verificar a conexão dos cabos
    - Verificar através do Menu Principal “Controle Manual” se a saída produz o efeito desejado.
    - Controlar as características elétricas do dispositivo remoto (Máxima carga 500 ohm)
- **Os relês não funcionam,…**
    - Verificar se o equipamento está alimentado corretamente
    - Verificar as seleções no menú principal
- **A tensão na porta Vdc In não bloqueia o equipamento…**
    - Verificar as conexões elétricas
    - Verificar se o gerador remoto está funcionando.

Nota: No caso de anomalia persistente contactar o fornecedor.

4.1 Tabela de Visualização de alarmes:

Alarme	Visualização	Estado do relê	Oque fazer	Prioridade
Hold	ALR Hold	RL1 e RL2 desabilitados	Eliminar o sinal na entrada de tensão Hold	1
OFA pre-alarme Tempo > 70%	OFA ALR	RL2 Fechado	- Pressionar enter para eliminar o alarme - Verificar instalação	2
OFA Alarme Tempo =100%	OFA Stop	RL2 Fechado	- Pressionar enter para eliminar o alarme - Verificar instalação	3
Banda de Alarme de medida	Banda ALR	RL2 Fechado	- Pressionar enter para silenciamento do relê 2 - Verificar instalação	4

pH veya Redox ölçüm aygıtı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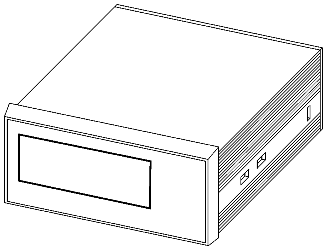
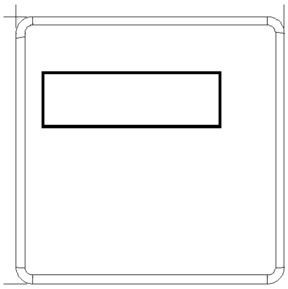
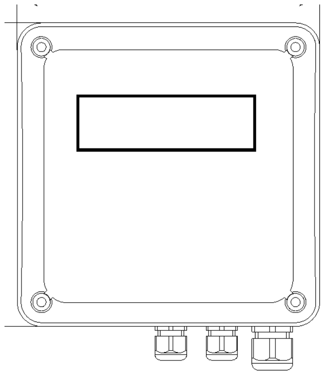






İÇİNDEKİLER

1 Başlarken sayfa 2
2 Kurulum sayfa 3
3 Ayarlar ve Çalıştırma sayfa 5
4 Sorun Giderme sayfa 11

1 HERHANGİ BİRŞEY YAPMADAN ÖNCE

1.1 HOŞ GELDİNİZ

➲ Lütfen, bu kılavuzu verilen uyarılara özellikle önem vererek dikkatlice okuyun. Yüz, gözler ve elbiseleriniz için yeterli koruma kullanmak da dahil olmak üzere, her zaman gerekli emniyet prosedürlerini uygulayın.

1.2 PAKET İÇERİĞİ

- Ölçüm aleti
- Sabitleme tutucuları
- Yönerge kılavuzu

1.3 TEKNİK ÖZELLİKLER

Kimyasal ölçüm aralığı: Redox için 0÷14,0 pH veya ±1000 mV
Hassasiyet: %1 FS pH o %1 FS Redox

Kimyasal ölçüm giriş empedansı: 1 x 10^{13} oHm
Kimyasal ölçüm sonda bağlantısı BNC
Sonda kalibrasyonu: Yazılım destekli

Sıcaklık ölçüm aralığı: -10 ila +100 °C (Çözünürlük 1 °C)
PT 100 veya aletin manüel ayarı vasıtasıyla 0'dan 100°C'ye kadar otomatik sıcaklık telafisi.

Röle çıkışı: Set Point 2 (maks. direnç yükü:10 A 250 VAC)

Akım çıkışları: 1 (maks. yük 500 ohm) [Hassasiyet ±2% F.S.]

Girdi: 15÷30 VAC/DC

Güç Beslemesi: 90÷265 VAC 50/60 Hz
Doğrusal Özgül Güç: Maks. 5VA
Sigortalar: 500 mA (gecikmeli)

Görüntüleme Sistemi: 2-satır 16-karakter LCD
Klavye: 4 tuş

Ebatlar:

- Panele monte edilmiş DIN Rayı;
- 48 x 96 x 98 mm'lik panele monte
- 96 x 96'lık panele monte
- 144 x 144'lik duvara monte

Koruma düzeyi:

- Din-Rayı = IP40
- 48x96 = IP40
- 96x96 = IP65 Ön panel
- 144x144 = IP65 Tamamen kutu

1.4 UYARILAR

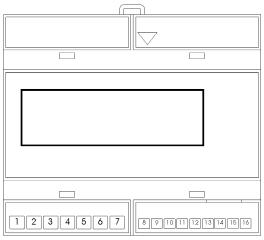
✋ Sistemi kurmadan ve çalıştırmadan önce lütfen bu el kitabını dikkatlice okuyun.
✋ Doz ayarlama birimi 3mm'lik maksimum temas boşluğuna sahip bir omnipolar anahtar vasıtasıyla güç beslemesine bağlanmalıdır.
✋Kurulum için satın alınan modeli ve bu el kitabında yer alan ayar ve programlama referanslarını kontrol edin.
✋Bağlantıları yaparken bu el kitabında verilen kontrol devre haritasına bakın.
☠ DİKKAT: **Yeterli göz, yüz ve el koruyucu donanımların kullanımıyla uygun giysi kullanımı dahil her zaman için gerekli güvelik prosedürlerini uygulayın.**
☠ DİKKAT: **Bu donanımı kurmadan veya bakım yapmadan önce her zaman güç beslemesini ayırın.**
➲ Her zaman için ürünlerini en mükemmel hale getirmek için çalışmaktadır ve herhangi bir zamanda önceden bildirilim yapılmaksızın değişiklik yapma hakkını saklı tutmaktadır.
➲ Bu el kitabında yer alan standartlara bağlı kalınmaması donanıma hasar verebileceği veya çalışmasını riske atabileceği kadar malda hasara ya da insanlarda yaralanmaya neden olabilir.

1.5 KURULUM İÇİN GEREKLİ MALZEMELER

Aletin kurulması için kendinize gerekli malzemeleri temin edin.

2 Mekanik ve Elektrik KURULUMU

2.1.___DIN Ray Sürümü (6 EN50022 DIN modülleri)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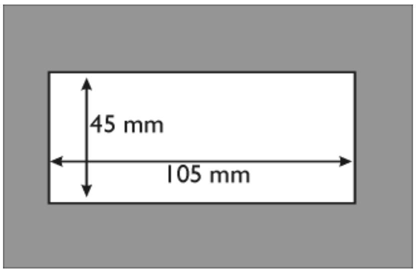
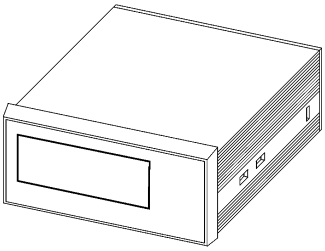
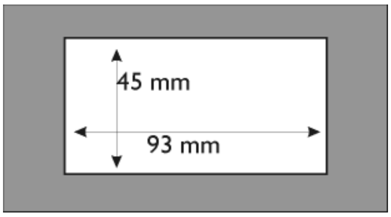
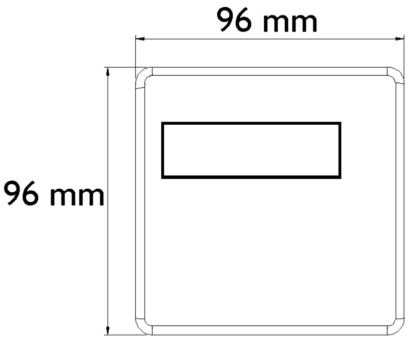


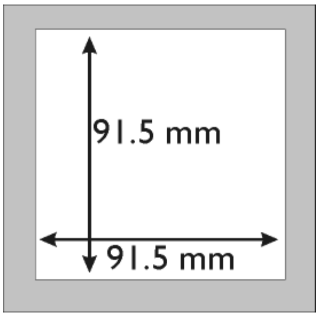
2.2___48 x 96 x 100 sürümü



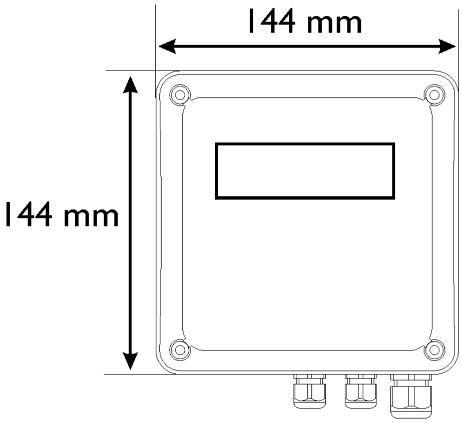


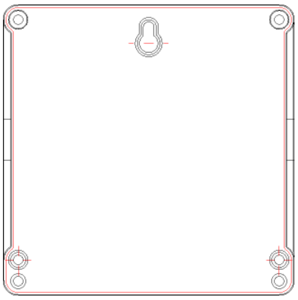
2.3___96 x 96 x 92 sürümü

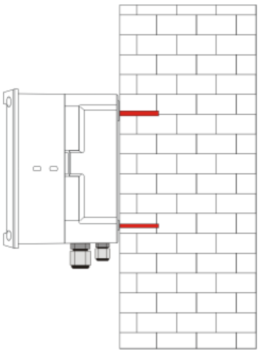



91.5 mm
91.5 mm

2.4__144 x 144 x 90 sürümü


144 mm
144 mm



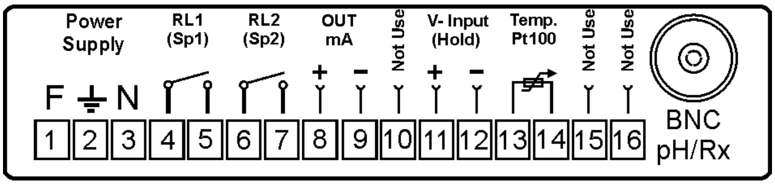


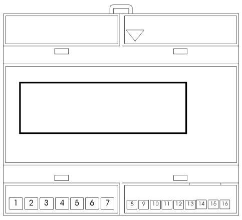
2.5 Elektrik bağlantılarının açıklaması

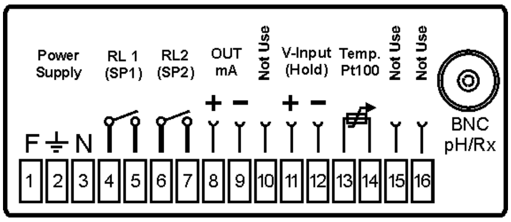
2.5.1__Elektrik bağlantı şeması

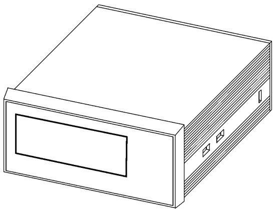
Terminal	**Tanımı**
1	Faz (230 VAC besleme)
2	Toprak
3	Nötr (230 VAC besleme)
4-5	Set Point 1 Röle
6-7	Set Point 2 Röle
8-9	0/4÷20 mA akim çikisi
10	Kullanılmıyor
11-12	VDC girişi VDC 15÷30 Vdc **Tutuşu**
13-14	Sıcaklık sondası girişi
15-16	Kullanılmıyor
BNC	pH/Redox sonda girişi

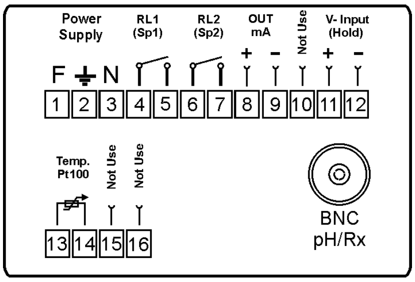
2.5.2__Her bir model için elektrik bağlantı etiketi

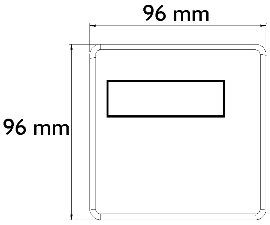

Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx

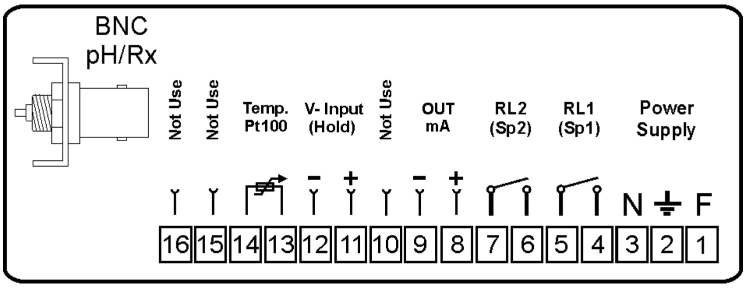

1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16

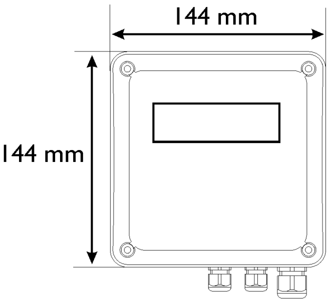

Power Supply
RL 1 (SP1)
RL2 (SP2)
OUT mA
Not Use
V-Input (Hold)
Temp. Pt100
Not Use
Not Use
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
BNC pH/Rx




Power Supply
RL1 (Sp1)
RL2 (Sp2)
OUT mA
Not Use
V- Input (Hold)
+ −
+ −
F N
1 2 3 4 5 6 7 8 9 10 11 12
Temp. Pt100
Not Use
Not Use
13 14 15 16
BNC pH/Rx




BNC pH/Rx
Not Use
Not Use
Temp. Pt100
V- Input (Hold)
Not Use
OUT mA
RL2 (Sp2)
RL1 (Sp1)
Power Supply
− +
− +
N F
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

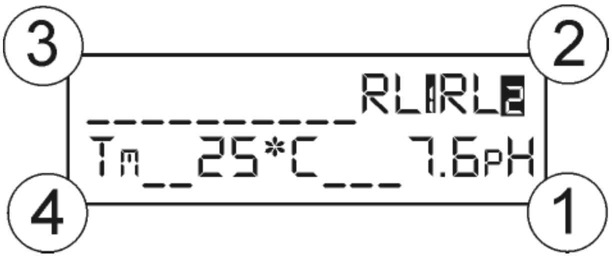

144 mm
144 mm

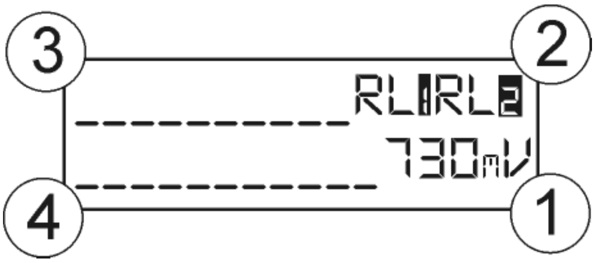
2.6 TESİSAT BAĞLANTILARI

Yok

3.0___AYARLAR VE ÇALIŞTIRMA

3.1__Alet Göstergesi





Alan 1 = pH veya Redox kimyasal ölçüm göstergesi
Alan 2 = Röle 1 ve 2 durum göstergesi Rölenin numarası yanıp sönüyorsa kontak, durum değiştirmiştir.
Alan 3 = Alarm göstergesi
Alan 4 = pH ölçümü için manüel veya otomatik sıcaklık göstergesi; bu alan Redox sürümü için boştur.
Not: Set Point 2 bir Alarm olarak belirlendiğinde RL2 ikonu RLA durumunu alır.

3.2__Alet klavyesi

Esc/Mode = İki işlevli tuş: **Esc** = Menüden çabuk çıkma, **Mode** = hızlı ayar menüsü
Esc/Mode = İki işlevli tuş: **Enter =** Onaylama işlevi, **Cal =** Çabuk kalibrasyon erişimi
Up = Arttırma tuşu
Down = Azaltma tuşu

Sonda kalibrasyon işlevi [3 saniye boyunca ***Cal*** tuşuna basılı tutun (Çıkmak için Esc tuşuna basın)]

- *pH sondasının kalibrasyonu*
    - Sondayı 7 pH çözeltisine daldırın ve Enter tuşuna basın.
    - Kendi kendini kalibre etmesi için 60 saniye bekleyin. Tamamlandığında sonda doğruluğu yüzde olarak gösterilir.
    - Sondayı 4 pH veya 9,22 pH çözeltisine daldırın ve Enter tuşuna basın.
    - Kendi kendini kalibre etmesi için 60 saniye bekleyin. Tamamlandığında sonda doğruluğu yüzde olarak gösterilir.
- *Redox sondasının kalibrasyonu*
    - Sondayı 465 mV'lik çözeltiye daldırın ve Enter tuşuna basın.
    - Kendi kendini kalibre etmesi için 60 saniye bekleyin. Tamamlandığında sonda doğruluğu yüzde olarak gösterilir.

Mode İşlevi (hızlı programlama menüsü) (1 saniye boyunca **Mode** tuşuna basılı tutun. *Up (yukarı) ve down (aşağı) tuşlarını kullanarak seçin)*

- Set Point 1   7,4 pH (Enter tuşuna basın ve yukarı ve aşağı tuşlarını kullanarak değeri ayarlayın)
- Set Point 2   7,4 pH (Enter tuşuna basın ve yukarı ve aşağı tuşlarını kullanarak değeri ayarlayın)
- Röle 1 (Röle durumunu değiştirmek için Enter tuşuna basın)
- Röle 2 (Röle durumunu değiştirmek için Enter tuşuna basın)

Not: 10 saniyeden sonra alet otomatik olarak çıkar.

Değer ayarları menü işlevi (5 saniye boyunca ***Enter*** ve ***Esc*** tuşlarına basılı tutun)

- Dil (Menü dilini ayarlayın)
    - İngilizce (UK), Fransızca (FR), İspanyolca (ES), Almanca (DE), İtalyanca (IT) olarak mevcuttur
- Set Point 1 (Röle 1 aracılığıyla doz ayarlama veya kontrol işlevlerini belirleyin)
- Set Point 2 (Röle 2 aracılığıyla doz ayarlama veya kontrol işlevlerini belirleyin)
- Sıcaklık (Menü sadece pH ölçümü için kullanılabilir)
- mA çıkışı (Akım çıkışını belirleyin)
- Gelişmiş (teknik yönetim menüsü)

Varsayılan parametreleri sıfırlama işlevi

- Aleti durdurun.
- **Yukarı** ve **Aşağı** tuşlarına birlikte basarak aleti çalıştırın.
- Alet "init._Default" durumunu gösterir. Yukarı ve Aşağı tuşlarını kullanarak Yes seçimini yapın.
- Alet varsayılan tüm parametreleri tekrar yükler.

Not: Menülerden çıkmak için, **Esc** tuşuna basın.

3.3__GENEL AYARLAR

Aynı anda **Enter ve Esc** tuşlarına basın**.** Değer Programlama:

Programlama Menüsü (Varsayılan parametreler)	
Dil	
Dil ayarı	UK
Set Point 1	
Set Point değeri	7,4 pH
Doz ayarının türü	Asit
Orantılı bant	0,4 pH
Ardıl izlem	0,0 pH
AÇIK Zamanlayıcı	KAPALI
KAPALI Zamanlayıcı	KAPALI
Başlangıcı Geciktirme	KAPALI
Sonu Geciktirme	KAPALI
Set Point 2 (Set Point 1 Doz ayarı veya Alarmı seçilebilir, bkz. gelişmiş menü)	
Set Point değeri	7,4 pH
Doz ayarının türü	Asit
Orantılı bant	0,4 pH
Ardıl izlem	0,0 pH
AÇIK Zamanlayıcı	KAPALI
KAPALI Zamanlayıcı	KAPALI
Başlangıcı Geciktirme	KAPALI
Sonu Geciktirme	KAPALI
Sıcaklık (*)	
Ölçüm birimi	°C
Manüel Değer	25 °C
mA Çıkışı	
0/4÷20 mA Aralığı	4÷20 mA
0 / 4 mA Değeri	0 pH Değeri
20 mA Değeri	14 pH Değeri
Gelişmiş	
ph/Redox'u seçin	pH
Doz ayarı veya Alarm Set Point 2	Doz ayarı
Girişi etkin veya etkin olmayacak şekilde tutun	Etkin değil = KAPALI
Kalibrasyon etkin veya değil	Etkin = AÇIK
İstatistikler	
Ölçüm alarmlarının miktarı	0
RL1 etkinleştirmelerinin miktarı	0
RL2 etkinleştirmelerinin miktarı	0
Tutulan giriş sinyallerinin miktarı	0
İstatistikleri Sıfırlama	
Kumanda Paneli	
Normalde açık veya kapalı olan Röle 1 kontağı	Normalde açık
Normalde açık veya kapalı olan Röle 2 kontağı	Normalde açık
Manüel akım çıkışı	0÷20 mA akım dinamosu
mV giriş sondası sinyali	Sinyali mV cinsinden gösterir
Mevcut sinyal tutuşu	Sinyal mevcut, AÇIK; yok, KAPALI
Sıcaklık sondası kalibrasyonu (**)	Dengeleme değerini belirleyin
Dengeleme kalibrasyonu	% cinsinden son kalibrasyondaki dengeleme
Kazanç kalibrasyonu (*)	% cinsinden son kalibrasyondaki kazanç
Bellenim sürümü	X.X
Aleti sıfırlama	Varsayılan değerleri geri yükleme
Şifre	0000

*menü sadece pH ölçümünde mevcuttur

**menü sadece sıcaklık sondası kurulumunda mevcuttur

3.3__Ayrıntılı ayarlar menüsünün programlanması

Aletin programlama menüsüne ulaşmak için 5 saniye boyunca Enter ve Esc tuşlarına birlikte basılı tutun.

Dil menüsü: Aşağıdakilerden istediğiniz dili seçin:
İtalyanca
İngilizce
Fransızca
İspanyolca
Almanca

Set Point 1 menüsü: Doz ayarlama parametrelerini belirleyin; tüm ayarlar Röle 1 tarafından etkinleştirilecektir.
Menüde şu öğeler bulunmaktadır:

Parça no.	Varsayılan	Sınırlar
Set Point değeri	7.4 pH / 750 mV	0÷14 pH / ±1000 mV
Doz ayarının türü	Asit/Düşük	Asit veya Alkalin/Yüksek veya Düşük
Orantılı bant	0,4 pH / 40 mV	0.4÷3 pH / 40÷300 mV
Ardıl izlem	0,0 pH / 0 mV	0÷3 pH / 0÷300 mV
AÇIK Zamanlayıcı	KAPALI	KAPALI…1÷480 dakika
KAPALI Zamanlayıcı	KAPALI	KAPALI…1÷480 dakika
Başlangıcı Geciktirme	KAPALI	KAPALI…3÷960 saniye
Sonu Geciktirme	KAPALI	KAPALI…3÷960 saniye

Set Point 2 menüsü: Doz ayarlama parametrelerini belirleyin; tüm ayarlar Röle 2 tarafından etkinleştirilecektir.
SET POINT 2 = Doz ayarı ise (bkz. Gelişmiş menü, sayfa 8) menüde Set Point 1'dekiyle aynı öğeler bulunur

SET POINT 2 = ALARM ise (bkz. Gelişmiş menü, sayfa 8), Röle 2 Set Point 1 için bir ölçüm alarmı olarak kullanılabilir. Dolayısıyla menü aşağıdaki şekilde değişir:

Parça no.	Varsayılan	Sınırlar
Set Point 1 alarm bandı	3 pH / 300 mV	0.1÷10 pH; 100÷1000 mV
OFA (Set Point 1 aşırı besleme alarmı)	KAPALI	KAPALI÷240 dakika

Sıcaklık menüsü: pH ölçümünün otomatik telafisi için sıcaklığı belirleyin. Ayrıca ölçüm birimi de belirlenebilir.

Parça no.	Varsayılan	Sınırlar
Ölçüm birimi	°C	°C; °F
Manüel Değer	25 °C	0÷100 °C; 32÷212 °F

Akım çıkışı: Akım çıkış ölçeğini ve değerini belirleyin.

Parça no.	Varsayılan	Sınırlar
Ölçek: 0/4÷20 mA	4÷20 mA	0÷20 mA; 4÷20 mA
Değer: 0/4 mA (*)	0 pH / -1.000 mV	0÷14 pH / ±1500 mV
Değer: 20 mA (*)	14 pH / 1.000 mV	0÷14 pH / ±1500 mV

(*Rampa değişimi için ölçeğin zıt değeri belirlenebilir:20 ÷ 4/0 mV)

Gelişmiş menüsü: Aletin fonksiyonlarının değiştirilmesi ve her bir fonksiyonun kontrol edilmesi için aşağıdaki öğeler kullanılabilir. Bu menü sadece uzmanlaşmış teknik personel içindir.

Parça no.	Varsayılan	Sınırlar
ph/Redox'u seçin	pH	pH; Redox
Doz ayarı veya Alarm Set Point 2	Doz ayarı	SP1 Doz ayarı veya Alarmı
Girişi etkin veya etkin olmayacak şekilde tutun	KAPALI	KAPALI= Etkin Değil; AÇIK= Etkin
Kalibrasyon etkin veya değil	AÇIK	KAPALI= Etkin Değil; AÇIK= Etkin

İstatistikler menüsü kullanılarak aletin etkinleştirilme veya değişim miktarı doğrulanabilir.

İstatistikler		
	Ölçüm alarmlarının miktarı	0
	RL1 etkinleştirmelerinin miktarı	0
	RL2 etkinleştirmelerinin miktarı	0
	Tutulan giriş sinyallerinin miktarı	0
	İstatistikleri Sıfırlama	

Yükleyiciye yardımcı olması için alet panelindeki her bir giriş ve çıkış aşağıdaki *Kumanda Paneli* menüsü kullanılarak manüel olarak belirlenip doğrulanabilir.

Kumanda Paneli		
	Normalde açık veya kapalı olan Röle 1 kontağı	Normalde açık
	Normalde açık veya kapalı olan Röle 2 kontağı	Normalde açık
	Manüel akım çıkışı	0÷20 mA akım dinamosu
	mV giriş sondası sinyali	mV cinsinden sonda sinyalini gösterir
	Mevcut sinyal tutuşu	Sinyal mevcut, AÇIK; yok, KAPALI
	Sıcaklık sondası kalibrasyonu (**)	Dengeleme değerini belirleyin
	Kalibrasyon dengeleme Değeri	% cinsinden son kalibrasyondaki dengeleme
	Kazanç kalibrasyonu (*)	% cinsinden son kalibrasyondaki kazanç
	Bellenim sürümü	X.X

*menü sadece pH ölçümünde mevcuttur
**menü sadece sıcaklık sondası kurulumunda mevcuttur

Not: Alet Kumanda Paneli menüsünden otomatik olarak çıkmaz bu yüzden yükleyici bunu manüel olarak yapabilir. Çıkmak için ESC tuşuna basın.

Varsayılan tüm parametreler *Alet Sıfırlama* menüsünden sıfırlanabilir. Ayarlar menüsünden otomatik olarak çıkar. varsayılan parametreler 6.sayfada gösterilmektedir.

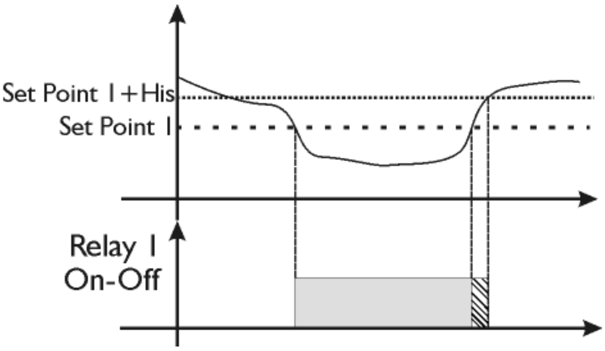
Aleti Sıfırlama	Varsayılan değerleri geri yükleme

Ayarlar menüsü *Şifre* menüsü aracılığıyla yetkisiz personelden korunabilir. Standart şifre 0000'dır. Programlanan şifre kaybedilirse veya unutulursa, fabrika varsayılan değerlerine sıfırlamak için 5.sayfada gösterilen gizli menüye girin.

Şifre	0000

3.4__Doz ayarı ve ayarlama örnekleri

Doz Ayarlama Çalıştırma/Duraklatma (AÇIK-KAPALI)

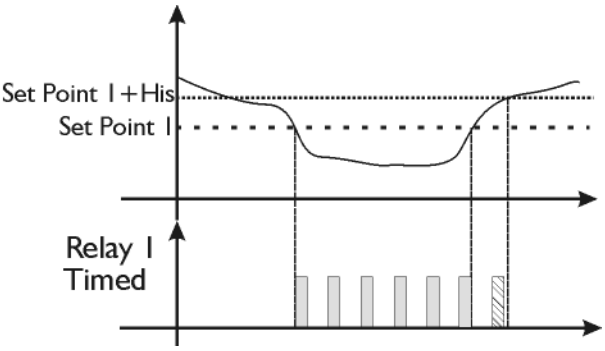


Alet kimyasal ölçümün Set Point 1 aracılığıyla otomatik olarak kontrol edilip değiştirilmesine ve doz ayarının Açık-Kapalı Röle 1 tarafından yapılmasına izin verir.
Yandaki doz ayarı örneği aşağıdaki parametreler kullanılarak belirlenebilir:

- Set Point 1 = 7.20 pH
- Doz Ayarının Türü = Alkalin
- Orantılı Bant = KAPALI
- Ardıl izlem = 0,40
- AÇIK Zamanlayıcı = KAPALI
- KAPALI Zamanlayıcı = KAPALI

Alet 7,20'lik değerlerin altında doz ayarlamasına başlayacaktır ve 7,60'ın üstüne gelindiğinde işlemi sona erdirecektir. Doz Ayarının Türü olarak Asit belirlenirse, doz ayarlaması yukarıdakinin tam tersi olacaktır: doz ayarlaması 7,20'nin üzerinde başlayıp 6,80 pH'nin altında sona erecektir. Alet Röle 2 ile ilişkili Set Point 2 ayarı vasıtasıyla iki bağımsız doz ayarlamasına izin verir.

Zamanlanmış Doz Ayarlaması

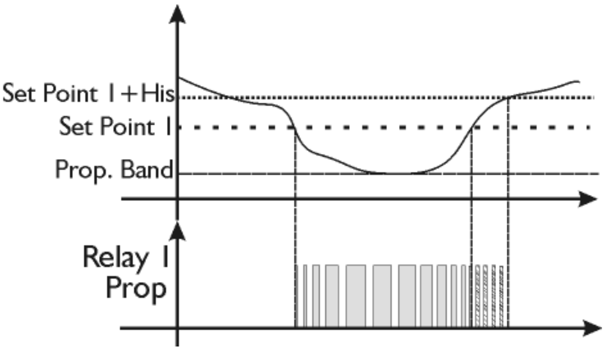


Alet kimyasal ölçümün Set Point 1 aracılığıyla otomatik olarak kontrol edilip değiştirilmesine ve doz ayarının Zamanlanmış Röle 1 tarafından yapılmasına izin verir.
Yandaki doz ayarı örneği aşağıdaki parametreler kullanılarak belirlenebilir:

- Set Point 1 = 7.20 pH
- Doz Ayarının Türü = Alkalin
- Orantılı Bant = KAPALI
- Ardıl izlem = 0,40
- AÇIK Zamanlayıcı = 5 dakika
- KAPALI Zamanlayıcı = 10 dakika

Alet 7,20'lik değerlerin altında zamanlanmış doz ayarlamasına başlayacaktır ve 7,60'ın üstüne gelindiğinde işlemi sona erdirecektir. Doz Ayarının Türü olarak Asit belirlenirse, doz ayarlaması yukarıdakinin tam tersi olacaktır: doz ayarlaması 7,20'nin üzerinde başlayıp 6,80 pH'nin altında sona erecektir. Alet Röle 2 ile ilişkili Set Point 2 ayarı vasıtasıyla iki bağımsız doz ayarlamasına izin verir.

Orantılı Doz Ayarlama (Prop)



Alet kimyasal ölçümün Set Point 1 aracılığıyla otomatik olarak kontrol edilip değiştirilmesine ve doz ayarının Orantılı Röle 1 tarafından yapılmasına izin verir.
Yandaki doz ayarı örneği aşağıdaki parametreler kullanılarak belirlenebilir:

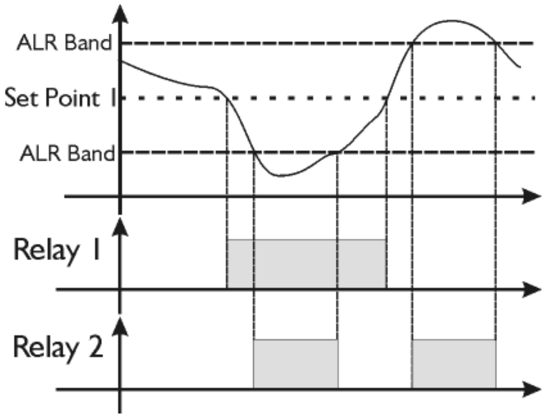
- Set Point 1 = 7.20 pH
- Doz Ayarının Türü = Alkalin
- Orantılı Bant = 0,40 pH
- Ardıl izlem = 0,40
- AÇIK Zamanlayıcı = 10 dakika (*)
- KAPALI Zamanlayıcı = 10 dakika (*)

Alet 7,20'lik değerlerin altında orantılı doz ayarlamasına başlayacaktır ve 7,60'ın üstüne gelindiğinde işlemi sona erdirecektir. Doz Ayarının Türü olarak Asit belirlenirse, doz ayarlaması yukarıdakinin tam tersi olacaktır: doz ayarlaması 7,20'nin üzerinde başlayıp 6,80 pH'nin altında sona erecektir. Alet Röle 2 ile ilişkili Set Point 2 ayarı vasıtasıyla iki bağımsız doz ayarlamasına izin verir.

(*AÇIK Zamanlayıcı ve KAPALI Zamanlayıcı için eşit zamanlar belirlendiğinde alet kimyasal ölçümün değişimine ilişkin otomatik olarak değiştirdiği toplam bir süreyi hesaplar. Ardıl izlem bandında en düşük değerde dozu ayarlar)

Not: Tüm ayarlamalarla doz ayarları Redox ölçümü içinde geçerlidir.

Set Point 1 için alarm olarak kullanılan Röle 2



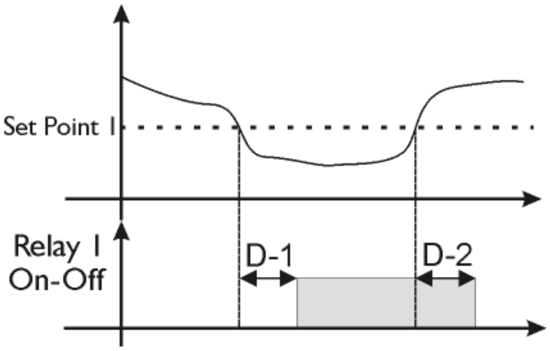
Alarm Bandı belirlendiğinde bir çalışma penceresi oluşturulur. Bu sınırlar aşıldığında ölçüm sıfırlanana veya alarmın etkisiz hale getirilmesi için Enter tuşuna basılana kadar Röle 2 kapanır ve kapalı kalır.

OFA zamanı (Aşırı Besleme Alarmı) belirlendiğinde, Set Point 1'in doz ayarlama süresi iki alarmla kontrol edilir:

- Birinci alarm: Programlanan zamanın %70'i ekranda gösterilir ve Röle 2 kapanır.
- İkinci alarm: Programlanan zamanın %100'ü ekranda gösterilir ve Röle 2 kapanır.

Enter tuşuna basarak alarmı devre dışı bırakın.
Not: RL2 ikonu RLA durumuna geçer.

Gecikmelerde doz ayarı



Alet başlangıç ve son geciktirmelerinde doz ayarına izin verir. Yandaki doz ayarı örneği aşağıdaki parametreler kullanılarak belirlenebilir:

- Başlangıç Geciktirmesi (D-1) = 5 dakika
- Son Geciktirmesi (D-2) = 5 dakika

Bu fonksiyon önceden açıklanan tüm ayarlar için kullanılabilir: AÇIK-KAPALI, Zamanlanmış, Orantılı

Not: Yukarıda gösterilen değişkenler Set Point 1 ve Set Point 2 için ayrı olarak kullanılabilir.

4 SORUN GİDERME

- **Aygıt çalışmıyor...**
    - Elektrik kablolarının doğru şekilde takıldığından emin olun
    - Güç beslemesinin mevcut olup olmadığını kontrol edin
- **Ekran açılmıyor...**
    - Ekran kontrastını kontrol edin
- **Kimyasal ölçüm fonksiyonu çalışmıyor...**
    - Sonda bağlantısını kontrol edin
    - El kitabında belirtildiği gibi kalibrasyonu gerçekleştirin
    - Sondayı değiştirin
- **mA çıkışı değişmiyor...**
    - Kablo bağlantısını kontrol edin
    - Çıkışın istenen etkiyi üretip üretmediğini kontrol etmek için ana menüdeki “Manüel Kontrol” fonksiyonunu kullanın
    - Uzaktan kumanda aygıtının elektrik özelliklerini kontrol edin (maksimum yük:750 ohm).
- **Röleler çalışmıyor...**
    - Aletin doğru şekilde çalıştırılıp çalıştırılmadığını kontrol edin
    - Ana menüdeki ayarları kontrol edin
- **VDC port voltajı aleti durdurmuyor...**
    - Elektrik bağlantılarını kontrol edin
    - Uzaktan kumandalı jeneratörün çalışıp çalışmadığını kontrol edin

Not: Sorun devam ederse tedarikçiyle bağlantı kurun.

4.1 Alarm tablosu:

Alarm	Ekran	Röle durumu	Çözüm	Öncelik
Tutma	Hold ALR	RL1 ve RL2 etkin değil	Tutma voltaj girişindeki sinyali devre dışı bırakın	1
OFA ön alarm Zamanı >%70	OFA ALR	RL2 Kapalı	-Alarmı devre dışı bırakmak için Enter tuşuna basın - Sistemi kontrol edin	2
OFA Alarm Zaman = %100	OFA Stop	RL2 Kapalı	-Alarmı devre dışı bırakmak için Enter tuşuna basın - Sistemi kontrol edin	3
Ölçüm alarm bandı	Band ALR	RL2 Kapalı	Röle 2'yi susturmak için Enter tuşuna basın - Sistemi kontrol edin	4

EK

FR -Mise au rebut du produit / Protection de l'environnement :
Conformément aux exigences de la directive DEEE - 2002/96/CE (Déchets d'Équipements Électriques et Électroniques), les produits électriques et électroniques usagés doivent être détruits séparément des ordures ménagères normales afin de promouvoir la réutilisation, le recyclage et d'autres formes de récupération, ainsi que de limiter la quantité de déchets devant être éliminés et de réduire du même coup les décharges. Lorsque vous vous débarrasserez de ce produit, respectez les prescriptions locales pour l'élimination des déchets. Ne le jetez pas dans la nature, mais remettez-le à un centre de collecte spécialisé de rebuts électriques et électroniques et/ou renseignez-vous auprès de votre revendeur lors de l'achat d'un nouveau produit.

TR - Ürün atıklarının imhası / Çevrenin korunması
Atık Elektrik ve Elektronik Donanım hükümleri Talimatı (WEEE - 2002/96/EC) gereğince tekrar kullanım, geri dönüşüm ve diğer geri dönüştürme biçimlerinin desteklenmesi ve imha edilecek atık miktarını ve dolayısıyla imha işlemlerini azaltmak amacıyla kullanılmış elektrik ve elektronik ürünleri normal ev atıklarından ayrı olarak imha edilmelidir. Bu ürünü imha ederken yerel atık imha talimatlarına uyunuz. Issız bir yere atmayınız: kullanılmış elektrik ve elektronik ürünlerinde uzmanlaşmış bir atık toplama merkezine götürünüz ve/veya yeni bir ürün alırken yetkili satıcınıza danışınız.

ES - Eliminación del producto / Protección del medio ambiente:
De conformidad con las exigencias de la directiva RAEE - 2002/96/CE (Residuos de Aparetos Eléctricos y Electrónicos), los productos eléctricos y electrónicos usados deberán destruirse aparte de las basuras domésticas normales con el fin de facilitar la reutilización, el reciclaje y otras formas de recuperación, así como de limitar la cantidad de residuos que deben ser eliminados y reducir al mismo tiempo los vertederos. Cuando se desprenda de este producto, respete las normas locales de eliminación de residuos. No lo arroje al medio ambiente, entréguelo en un centro de recogida especializado en residuos eléctricos y electrónicos o infórmese a través del vendedor cuando adquiera un nuevo producto.

DE -Entsorgung Des Produktes - Umweltschutz:
In Übereinstimmung mit der EEAG-Richtlinie - 2002/96/EG (Entsorgung von Elektro- und Elektronikabfällen) müssen Elektro- und Elektronik-Altgeräte vom normalen Hausmüll getrennt entsorgt werden, um die Wiederverwendung, das Recycling und andere Arten der Wiedergewinnung zu fördern sowie die zu vernichtende Abfallmenge zu beschränken und somit gleichzeitig die Mülldeponien zu reduzieren. Beachten Sie bitte die lokalen Vorschriften für die Entsorgung von Abfällen, wenn Sie sich von diesem Gerät trennen möchten. Werfen Sie es nicht in die Natur, sondern geben Sie es bei einer speziellen Sammelstelle für Elektro- und Elektronikabfälle ab und/oder informieren Sie sich bei Ihrem Händler beim Kauf eines neuen Produktes

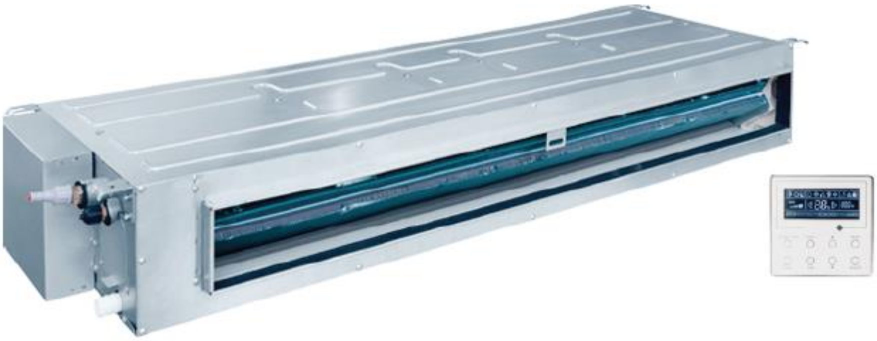
IT - Scarto in disparte del prodotto / Protezione dell'ambiente:
In conformità con le esigenze della direttiva RAEE – 2002/96/CE (Rifiuti di Apparecchiature Elettriche ed Elettroniche), i prodotti elettrici ed elettronici usati devono essere distrutti separatamente dai normali rifiuti domestici allo scopo di favorire il riutilizzo, il riciclaggio e le altre forme di recupero, oltre a limitare la quantità di rifiuti che devono essere eliminati ed a ridurre allo stesso tempo le discariche. Quando dovete sbarazzarvi di questo prodotto, rispettate le norme locali per l'eliminazione dei rifiuti. Non gettatelo in mezzo alla natura, ma consegnatelo ad un centro di raccolta specializzato in scarti elettrici ed elettronici e/o informatevi presso il vostro rivenditore al momento dell'acquisto di un nuovo prodotto.

NL -Wegwerpen van het product / Bescherming van het milieu:
In overeenstemming met de vereisten van de AEEA – richtlijn - 2002/96/EG (afgedankte elektrische en elektronische apparatuur), dienen versleten en gebruikte elektrische en elektronische producten apart van het normale huisvuil vernietigd te worden ter bevordering van hergebruik, recycling en andere vormen van herverwerking om zo tegelijkertijd de hoeveelheid te verwerken afvalstoffen alsmede de omvang van de vuilstortplaatsen terug te dringen. Neem, indien u dit product weg wilt werpen, de voorschriften voor afvalverwerking in acht. Werp het product niet in de natuur weg maar breng het naar een specifiek verzamelpunt voor elektrisch en elektronisch afval en /of vraag uw dealer om inlichtingen tijdens de aanschaf van een nieuw product.

PT - Eliminação do produto / Protecção do ambiente :
Nos termos do disposto na Directiva relativa aos resíduos de equipamentos eléctricos e electrónicos – 2002/96/CE (REEE), e com vista à promoção da reutilização, da reciclagem e de outras formas de recuperação, por um lado, e a limitar a quantidade de resíduos a serem eliminados e, simultaneamente, a reduzir as descargas, pelo outro, os produtos eléctricos e electrónicos usados devem ser eliminados separadamente em relação ao lixo doméstico. Quando este seu produto chegar ao fim da sua vida útil, cumpra o disposto na legislação local relativamente à eliminação de resíduos. Nunca junte este produto ao lixo doméstico; em vez disso, entregue-o num centro de recolha especializado na eliminação de produtos eléctricos ou electrónicos e/ou informe-se das medidas a tomar junto do seu revendedor aquando da aquisição de um produto novo

ATTACHMENT 06

ENERGY AND AIR-CONDITIONING SOLUTIONS



feelplus+

User & Installation Manual

Duct	Cassette	Floor-Ceiling	Outdoor Unit
DSV1218HE32	CSV1818HE32	FSV1818HE32	MSV1218HE32
DSV1818HE32	CSV2418HE32	FSV2418HE32	MSV1818HE32
DSV2418HE32	CSV3618HE32	FSV3618HE32	MSV2418HE32
DSV3618HE32	CSV4818HE32		MSV3618HE32
DSV4818HE32			MSV4818HE32
DSV6018HE32			MSV6018HE32

DECLARATION OF CONFORMITY

ECA TECHNOLOGY S.R.L.
Via Dell'Industria, 51
36040 Grisignano di Zocco (VI) – Italy

You declare under your own responsibility that the following air conditioners:

I.U.Duct	U.I. Floor-Ceiling	U.I. Cassette	Outdoor Unit
DSV1218HE32	FSV1818HE32	CSV1818HE32	MSV1218HE32
DSV1818HE32	FSV2418HE32	CSV2418HE32	MSV1818HE32
DSV2418HE32	FSV3618HE32	CSV3618HE32	MSV2418HE32
DSV3618HE32		CSV4818HE32	MSV3618HE32
DSV4818HE32			MSV4818HE32
DSV6018HE32			MSV6018HE32

The products described above are in accordance with:

REGULATION 2012/206/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 March 2012 on ecodesign requirements for air conditioners and fans implementing Directive 2009/125/EU.

DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014
on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (recast)

DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014
on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)

DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011
on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

DIRECTIVE 2003/108/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 December 2003
amending Directive 2002/96/EU on waste electrical and electronic equipment (WEEE).

Grisignano di Zocco, 08/01/2021

ECA TECHNOLOGY SRL
Gianfranco Baniero
Delegate

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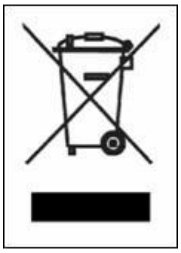
INFORMATION FOR ENVIRONMENTAL PROTECTION

This unit contains **R32** fluorinated greenhouse gas covered by the Kyoto Protocol. Maintenance and disposal operations must be carried out only by qualified personnel.
Refrigerant leaks contribute to climate change. Refrigerants with a lower global warming potential, if dispersed into the atmosphere, contribute less to this phenomenon. This air conditioner contains a refrigerant with a GWP GWP potential of 675. This means that if 1 kg of this refrigerant were dispersed into the atmosphere, the impact on global warming would be 675 times higher than 1 kg of CO_2, over a period of 100 years. Do not operate independently on the refrigerant and always contact a professional.

Model Outdoor Unit	**Cooling**			
	Type	**Preload kg**	**GWP**	**tons CO2 equivalent**
MSV1218HE32	R32	0,78	675	0,527
MSV1818HE32	R32	1,00	675	0,675
MSV2418HE32	R32	1,60	675	1,080
MSV3618HE32	R32	2,50	675	1,688
MSV4818HE32	R32	2,80	675	1,890
MSV6018HE32	R32	3,60	675	2,430

PACKAGING DISPOSAL STANDARDS
- All product packaging materials must be delivered to collection centers for proper disposal.
-The refrigerant gas must be fully recovered by qualified personnel in special containers and be delivered to the collection centers.
-The lubrication oil contained in the compressors and refrigerant circuit must be recovered and delivered to the collection centres.
- Inquire with your municipality about how to dispose of waste.

INFORMATION TO USERS



Pursuant to art. 13 of Legislative Decree 25 July 2005, n. 151 "Implementation of Directives 2002/95 / EC, 2002/96 / EC and 2003/108 / EC, relating to the reduction of the use of hazardous substances in electrical and electronic equipment, as well as waste disposal" and Legislative Decree 4 March 2014, n. 27 "Implementation of Directive 2011/65 / EU (RoHS2) on the restriction of the use of certain hazardous substances in electrical and electronic equipment".

The crossed-out bin symbol on the equipment or its packaging indicates that the product must be collected separately from other waste at the end of its useful life. The **user** must, therefore, deliver the equipment at the end of its life to the appropriate separate collection centers for electronic and electrotechnical waste, or return it to the retailer at the time of purchase of a new equipment of an equivalent type, at a rate of one to one.

In the case of professional users (**companies or institutions**) pursuant to the aforementioned legislation, the separate collection of this equipment at the end of its life is organized and managed:

a) directly by the user, in the event that he decides to dispose of the equipment without replacing it with an equivalent new equipment used for the same functions;
b) by the manufacturer, understood as the person who first introduced and marketed in Italy or resells in Italy under his own brand the new equipment that replaced the previous one, in the event that, together with the decision to discard the equipment at the end of its life, the user makes a purchase of a product of an equivalent type and used for the same functions. In the latter case, the user may request the manufacturer to collect this equipment no later than 15 consecutive calendar days from the delivery of the aforementioned new equipment. At the end of 15 days from the date of purchase of the equivalent product and used for the same functions, the right to request the withdrawal of the equipment at the end of its life to the manufacturer lapses.

Adequate separate collection for the subsequent disposal of discarded equipment for environmentally compatible recycling, treatment and disposal helps to avoid possible negative effects on the environment and health and promotes the reuse and/or recycling of the materials of which the equipment is composed.
The abusive disposal of the product by the user involves the application of the penalties referred to in the current law.

SAFETY INSTRUCTIONS

- **Read this manual carefully before using the air conditioner. If you have any doubts or problems, please contact your dealer.**
- **This appliance contains environmentally friendly, but potentially flammable R32 gas. Improper use of the unit can cause serious damage to persons and/or property. It is recommended that installation and maintenance are carried out only by qualified personnel in possession of a refrigeration license in order to operate correctly and safely with flammable refrigerants.**
- **Turn off** the **unit and the omnipolar switch before performing maintenance, repair or cleaning** work**.**
- Do not install the air conditioner in dusty places or places where flammable gas leaks may occur.
- For installation/maintenance/repair operations, equip yourself with appropriate protective devices (gloves, eye protection, helmet, ...) And don't wear clothes or accessories that could get entangled.
- Do not use means to speed up the defrosting or cleaning process, other than those recommended by ECA Technology.
- Do not use the air conditioner in the presence of oil or vapors.
- If abnormal conditions occur, such as burning smell, turn off immediately and Contact the specialized technician. Do not modify or attempt to repair the drive yourself!
- Do not turn the air conditioner on and off using the main switch. Always use the on/off button on the remote control.

- Do not introduce fingers or other objects into the air inlet and outlet grilles.
- Do not expose yourself for a long time to direct air flow and do not let children play near the air conditioner.
- Do not overcool or heat the room.
- Never touch the unit with wet hands.
- Ventilate the room from time to time, especially if gas appliances are in operation at the same time.
- Do not pour water or other liquid on the air conditioner for cleaning.
- Install on a solid surface that can support the weight of the air conditioner. Make sure that the stand is firmly installed and the unit is absolutely stable even after a long time in operation.
- To protect the air conditioner from excessive corrosion, do not install the outdoor unit where it can be directly exposed to sea water splashes or sulfur vapors in health resorts.
- Before commissioning the air conditioner, make sure that the electrical cables, condensate drain pipes and refrigerator connections are properly installed/ executed to avoid water leaks, refrigerant gas leaks and/or electrical discharges.

ELECTRICAL REQUIREMENTS

- Electrical connections must be made by a specialized electrician and must comply with local electrical regulations .
- Before installation, make sure that the supply voltage of the installation site is the same as indicated on the air conditioner nameplate. Incorrect power supply may cause damage to the unit, leading to fire. The voltage must be stable, there must be no large fluctuations.
- Highly dangerous electrical voltages are used in this electrical circuit. Refer to the wiring diagram and these instructions when connecting. Improper connections and inadequate grounding can result in accidental injury or death.

- It is mandatory to perform the grounding (yellow-green wire usable only for grounding) according to local electrical standards. The grounding cable should not be connected to the gas pipes, water pipes, lightning rod, to the telephone line. Check that the appliance is always grounded correctly, otherwise electric shock or damage to the unit may occur.
- Secure the cables well, which must be of adequate section. Inadequate connections can cause overheating and a possible fire.
- Electrical cables must not come into contact with refrigerant pipes, compressor or moving parts of the fan.
- When connecting power and control lines, do not use multi-conductor cables. Use separate cables, intact and of appropriate cross-section , for each type of line.
- To protect the unit from short circuits, mount an omnipolar magnetothermic switch on the power supply line with a minimum contact distance of at least 3 mm at all poles.
- If the units are installed in places exposed to electromagnetic interference it is necessary to use shielded twisted cables for communication links between the units.
- Disconnect the unit from the mains using the external disconnector before opening the electrical panel.
- Do not use extension cords. Do not use mains outlets in common with other users.
- Do not use the rolled power cord or modify or damage it. If damaged, contact the authorized technician.
- Periodically check the installed safety devices.

⚠ **PRECAUZIONE**

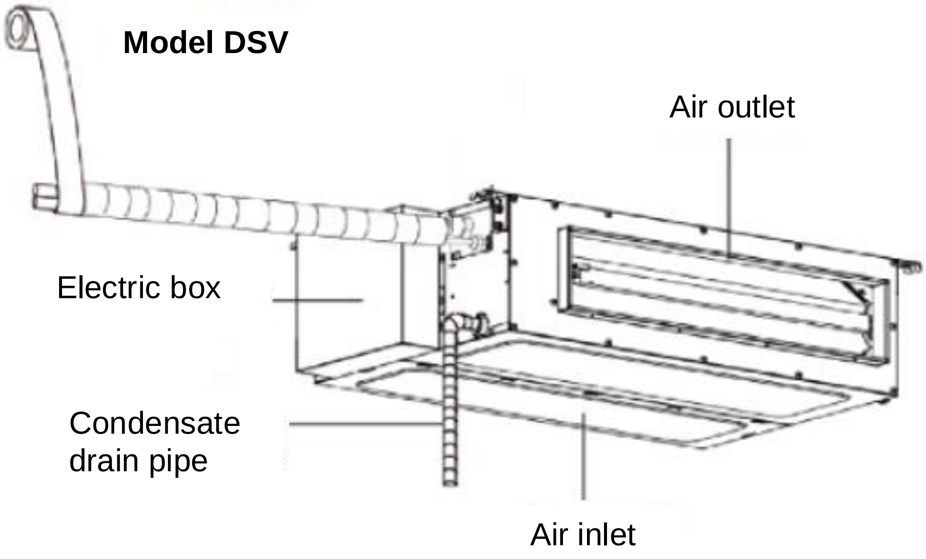
To heat the system, the main power switch must be turned on (ON) at least five (5) hours before starting operation of the air conditioner. Always leave the **main switch on (ON) unless the system is not used for an extended period of time.**

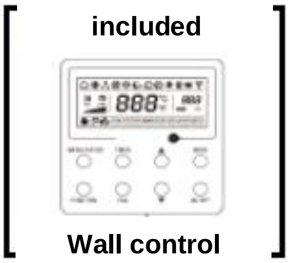
USEFUL TIPS FOR SAVING ENERGY

- Close doors and windows during operation.
- Adjust the room temperature appropriately.
- Do not obstruct the air inlet or outlet from the air conditioner, as this may not work properly.
- Always keep the air filter clean. If the filter is clogged the performance of the air conditioner is reduced.
- Use ventilation flaps effectively.
- If you do not use the unit for a long time, turn off the unit with the remote control and dispower the air conditioner from its magnetothermic switch.

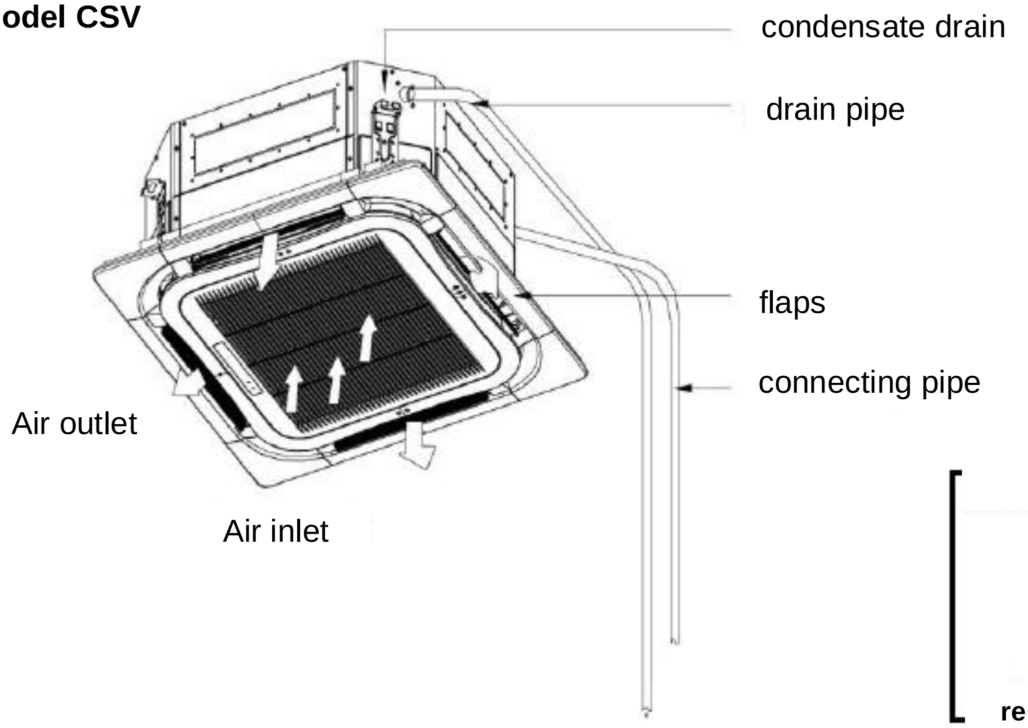
COMPONENT NAMING

Model DSV


Air outlet
Electric box
Condensate drain pipe
Air inlet

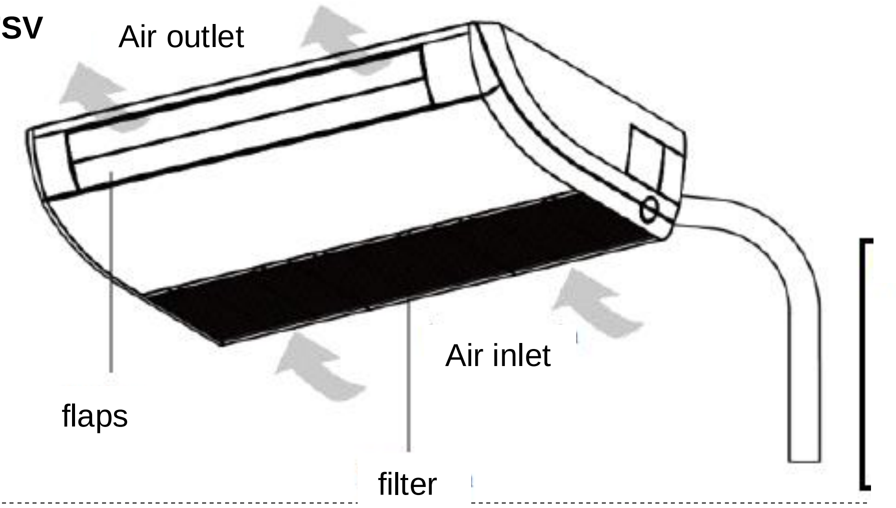

included
Wall control

Model CSV


condensate drain
drain pipe
flaps
connecting pipe
Air outlet
Air inlet

included
remote control

Model FSV


Air outlet
Air inlet
flaps
filter

included
remote control

REMOTE CONTROL (standard for CSV cassette and FSV ceiling floor models)

Note: This is a universal remote control, so some features may not be available for some models.

KEY DESCRIPTION

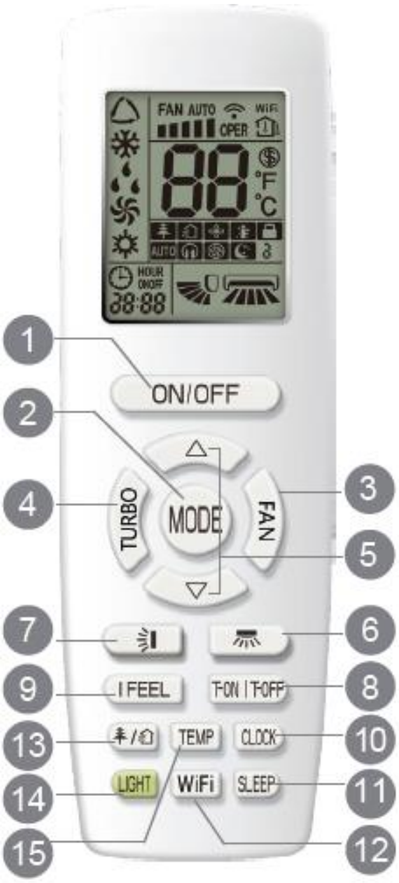
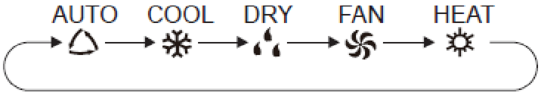


Fig.

1 ON/OFF allows you to turn the air conditioning on and off

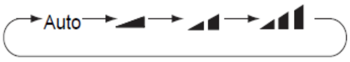
2 MODE   allows you to selectthe operating mode:



Automatic operation
Conditioning
Dehumidification
Ventilation (air circulation in the room)
Heating

Note: In automatic mode the temperature is not displayed
It cannot be set.

3 FAN   allows you to select the ventilation speed
(automatic, low, medium, high)



- In DRY mode (dehumidification) the ventilation speed is Set to low by default.
- In COOL (conditioning) or DRY (dehumidification) mode Press and hold the FAN key for 2 seconds to activate the function X-FAN, which allows the fan to work at low speed to a few minutes (even if the air conditioner is then turned off) at the in order to dry the indoor unit from the moisture that forms at its internal during normal operation in air conditioning, and/or dehumidification.

The symb appears on the display when the function is activated.
When the operation is complete, the function is automatically deactivated.
Alternatively, you can disable the function manually by pressing the FAN key for 2 seconds during the operation.

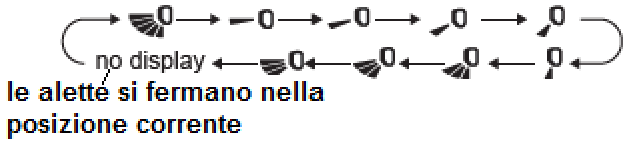
4 TURBO   In air conditioning or heating mode, press this button to activate the Turbo function. If the function is active, the symbol is displayed on the display, but changing the mode of operation, this function is automatically deactivated.

This function allows you to start the unit at maximum ventilation speed to be able to reach the set temperature in the shortest possible time.
Press the TURBO button again to disable the function.

5 ▲▼ press   the ▲ button to increase or ▼ to decrease the desired temperature by 1°C. Holding down the button changes the temperature more quickly.
The temperature cannot be set if the air conditioner is operating in automatic mode;   It will be automatically setto by the unit based on the ambient temperature present at that time.

6   Function not available for this series

7 allows you to adjust the position of the fins (vertical oscillation), i.e. the direction of air flow in the following order:



Press and hold the key for 2 seconds to stop the swing in the desired position:

: the fins oscillate automatically fromtop to bottom.

: the air is directed to the selected location.

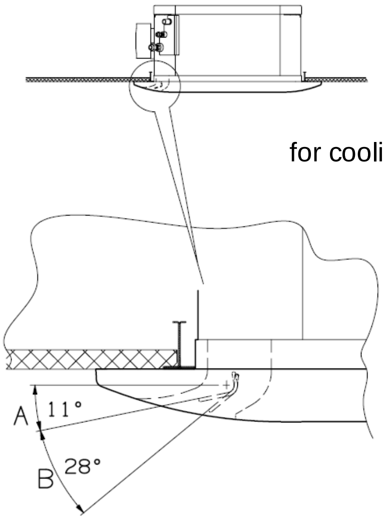
: The air is directed towards the selected angle.

It is advisable to orient the fins upwards when the appliance is in cooling mode, to avoid the direct flow of cold air.

In heating mode, however, orient the fins downwards as the hot air tends to head upwards.

NOTE: Do not adjust the flaps with your hands during operation

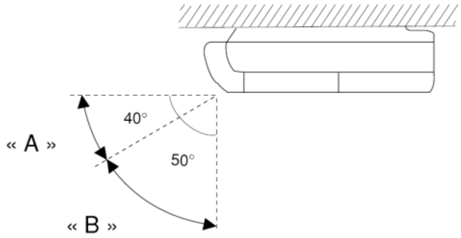
RECOMMENDED TILT FOR CSV CASSETTE MODEL



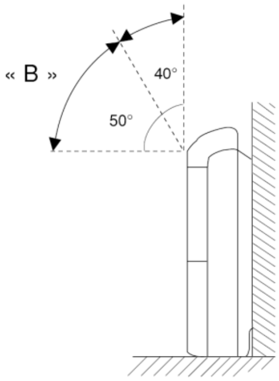
“A” zone
for cooling and dehumidification

“B” zone
for heating

RECOMMENDED INCLINATION FOR FSV CEILING FLOOR MODEL



“A” zone
for cooling and dehumidification



“B” zone
for heating

8 T-ON / T-OFF **T-ON** allows you to set the time when the air conditioner is switched on.

When the unit is off, press this button, the symbol is displayed and "ON" flashes on 🕒 the remote control display. Within 5 seconds set the power time using the ▲and▼ keys (holding them for a long time, the time changes faster) andd, within 5 seconds of setting the time, press T-ON again for confirmation.

To cancel the automatic ignition at the scheduled time, press the "**T-ON**" key again.

T-OFF allows you to set the time when the air conditioning is turned off.

When the unit is on, press this button, the symbol is displayed and "O🕒FF" flashes on the Remote control display. Within 5 seconds set the shutdown time using the ▲ and ▼ keys (by holding them for a long time, the time changes more quickly) and,within 5 seconds of setting of the time, press T-OFF again to confirm.

To cancel the automatic shutdown at the scheduled time, press the "**T-OFF"** button again.

Upon reaching the time set for automatic switching on and / or off, the timer function (ON and/or OFF) remains active even in the following days.

9 I FEEL Press this button to start the **I FEEL** function: the symbol appears on the remote control .

If the function is active, the remote control, equipped with a special sensor, sends the detected ambient temperature to the indoor unit, which will then adjust its operation automatically according to the difference between the detected temperature and the set temperature.

Do not place the remote control near objects with high or low temperature to prevent it from detecting an incorrect ambient temperature.

To delete this function, press the "I FEEL" button again.

10 CLOCK Allows you to set the current time.

By pressing this button, the symbol 🕒 starts flashing on the remote control display.

Within 5 seconds set the time using the ▲e▼ keys (holding them for a long time, the time changes more quickly) and confirm by pressing the "CLOCK" key again.

The symbol🕒 stops flashing.

11 SLEEP Allows you to activate/deactivate the night function, which allows you to automatically adjust the temperature in order to make the room more comfortable during the night hours.

Press the ON/OFF button, select an operating mode using the MODE button and

Set the desired temperature.

Press the SLEEP button until the symbol appears on the display. ☾

In cooling mode the set temperature is gradually increased during the first two hours of operation. In heating mode the set temperature is gradually decreased by during the first two hours of operation.2°C 2°C You can also program the device to stop by pressing **T-OFF**. This function is not available if the unit is in DRY (dehumidification), FAN (Ventilation) or AUTO (Automatic) mode.

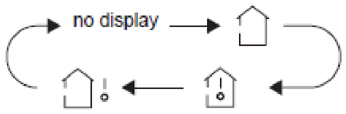
12 WIFI Press the WIFI button on the remote control to activate the function (optional function that requires the purchase of a special module to be installed in the indoor unit). When the function is active, the icon appears on the display of the remote control. (WIFI)

Press the key again to disable the function and the icon disappears. (WIFI)

13 🌲/🏠 function not available for this series.

14 LIGHT Allows you to activate/deactivate the display lighting of the indoor unit. When it is active on the remote control it appears 💡 .

15 TEMP Allows you to display in order: the set temperature, the ambient temperature and the outside temperature.



Set temperature

Internal ambient temperature

Outdoor temperature

When you select the indoor or outdoor ambient temperature display, the indoor unit display shows the corresponding temperature for 3-5 seconds, after which it automatically returns to the set temperature. In some models, the outdoor temperature display is not available. The indoor unit still receives the signal, but mosbetween the set temperature.

KEY COMBINATIONS

- ▲E▼: pressing them simultaneously locks the remote control keypad and the symbol 🔒 appears on the remote control display. With the keyboard locked, se you press any key on the remote control the icon flashes three times without sending the signal to the unit.
  Press the ▲e▼ keys again at the same time to disable the keyboard lock.
- **MODE and ▼**: pressing them simultaneously when the machine is switched off, the unit of measurement of temperature changes from °C to °F (Fahrenheit) and vice versa.
- **TEMP** and **CLOCK:** pressing them simultaneously in heating mode activates the "heating 8 ° C" function (symbol 💲displayed if the function is active), which allows you to maintain a set point at 8 ° C so that the room temperature never drops below 8 ° C (useful in case of prolonged absence).

REPLACEMENT BATTERIES REMOTE CONTROL

1. Remove the back cover of the remote control (fig.3.1).
2. Extractand the old batteries (fig.3.2).
3. Insert two new AAA 1.5V batteries of the same brand, lending Attentionsone to polarity +/- (fig.4.3).
4. Insert the lid (fig.4.4).

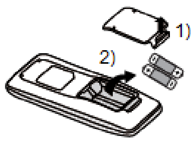


Fig.

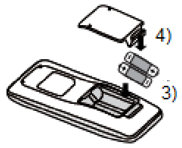


Fig.

NOTES

- Make sure there are no obstructions between the receiver and the remote control
- Treat the remote control carefully. Do not get wet, throw it or drop it.
- Do not leave it in damp or too hot places.
- The remote control must stay away fromCRT TVsof at least .1 m
- If the remote control is not used for a long time, it is advisable to remove the batteries.
- Replace the batteries if the signal effect is not good or if the symbols on the display disappear.

PROGRAMMING OPERATING MODE

CAR MODE

1. Press the ON/OFF button to turn on the air conditioning.
2. Press the MODE button to set the operation in AUTO (automatic).
   Based on the ambient temperature, the unit automatically sets all the operating parameters that allow you to get the best comfort.

AIR CONDITIONING, HEATING OR DEHUMIDIFICATION

1. Press the ON/OFF button to turn on the air conditioning.
2. Press the MODE button to set the desired operating mode: air conditioning, heating or dehumidification.
3. Press the ▲o▼ button to set the desired temperature.
4. Press the FAN button to set theventilation speed (function cannot be activated if the machine is operating in dehumidification mode).
5. Press the key to adjust the orientation of the fins. Press it again to stop the vertical oscillation in the desired location.

AUTOMATIC RESET FUNCTION

If a power outage occurs during operation, the operating state prior to the power failure is stored, so 3-4 minutes after the power returns, the unit automatically restarts
in the previously stored operating state (3-4 minutes before reboot is a protection time for
the compressor).

WALL CONTROL (standard for DSV ductable model)

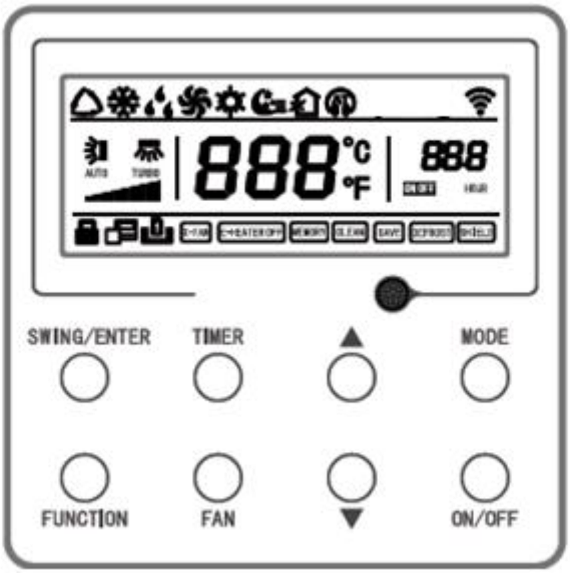

888 °C °F
888
AUTO
TURBO
HOUR
SWING/ENTER
TIMER
MODE
FUNCTION
FAN
ON/OFF

Fig. 5th

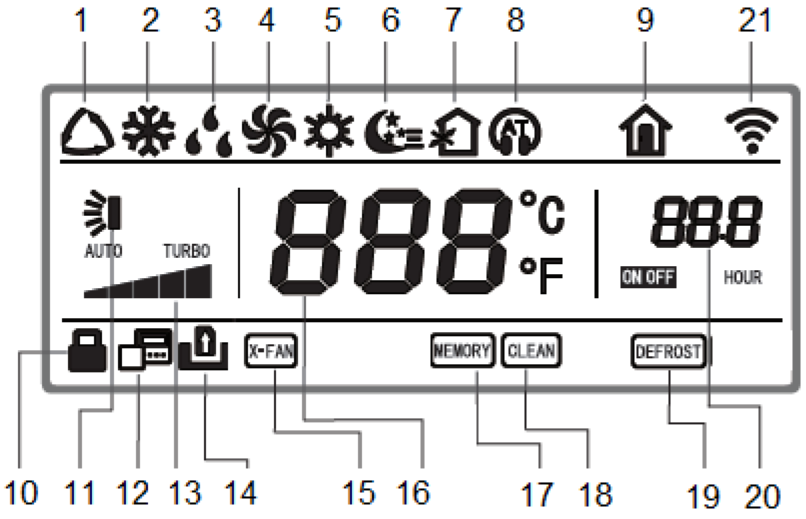

1
2
3
4
5
6
7
8
9
21
AUTO
TURBO
888 °C °F
888
ON OFF
HOUR
X-FAN
MEMORY
CLEAN
DEFROST
10
11
12
13
14
15
16
17
18
19
20

Fig. 5b

NR	DESCRIPTION
1	AUTOMATIC operation mode is on
2	COOLING operation mode is on
3	DRY operation mode is on
4	FAN operation mode is on
5	HEATING operation mode is on
6	SLEEP function (active)
7	Not available
8	QUIET function for noise reduction
9	8°C Heating function
10	Keypad lock indicator
11	Upwards louver swinging
12	Not available
13	Fan speed indicator
14	Not available
15	X-FAN function on (to eliminate condensation water)
16	Set temperature indicator
17	Memory indicator for automatic restart (automatic switch-on at the last operation status after a power failure)
18	Filter cleaning deminder
19	Outdoor unit defrost in progress (during heating mode).
20	Set timer indicator
21	WIFI (optional function available only if the special module has been purchased and installed on board the air conditioner)

PROGRAMMING OPERATING MODE
(through wall control - for ductable model DSV)

BUTTONS

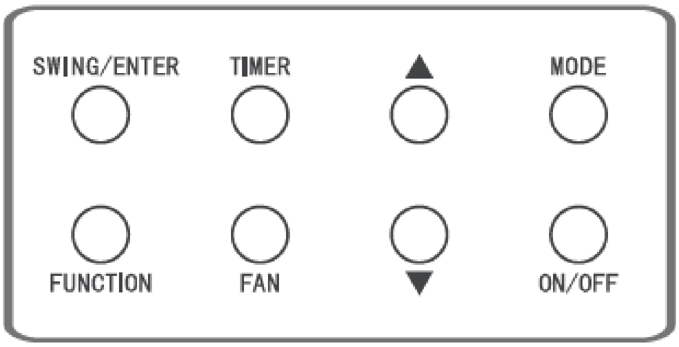

SWING/ENTER
TIMER
▲
MODE
FUNCTION
FAN
▼
ON/OFF

Fig.

1. Press the ON/OFF button to turn on the air conditioner (Press it to turn off the air conditioner).

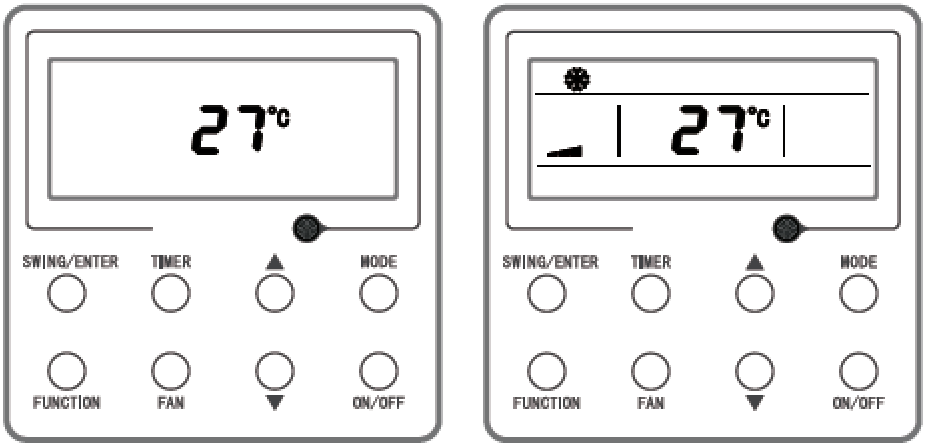
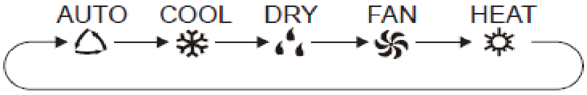

27°C
27°C
SWING/ENTER
TIMER
▲
MODE
FUNCTION
FAN
▼
ON/OFF
SWING/ENTER
TIMER
▲
MODE
FUNCTION
FAN
▼
ON/OFF

Fig. 6A - Unit off Fig. 6b - unit on
(on the display remains displayed the(on the display the temperature is displayed
set temperature)set, ventilation speed and operation)

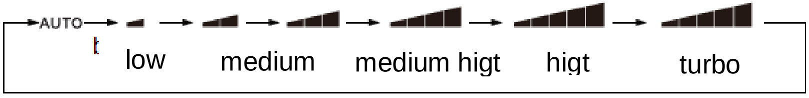
2. When the unit is on, press the MODE button to set the desired operating mode in the following order :
Automatic - Air Conditioning - Dehumidification - Ventilation - Heating


AUTO
COOL
DRY
FAN
HEAT

- AUTO mode (automatic): the unit automatically sets all suitable operating parameters according to the internal temperature; If the automatic mode is active, it is not possible to set the temperature.
- COOL mode: the unit cools the ambient air until it reaches the set temperature.
- DRY mode (dehumidification): allows to dehumidify the ambient air.
- FAN mode (ventilation): allows you to set only the ventilation and the SWING function (fin oscillation) to operate the unit only in ventilation mode (without cooling or space air heating).
- HEAT mode: the unit heats the ambient air until the set temperature is reached.

3. Press the▲ (increase) or ▼ (decrease) button to set the desired temperature from 16°C to 30°C.
At each press of the button the temperature varies by 1°C. Holding down the button changes the temperature more quickly. The temperature cannot be set if the unit is operating in automatic mode (AUTO).

4.Press the FAN button to set the ventilation speed in the following order:


AUTO
t
low
medium
medium higt
higt
turbo

- In dehumidification mode the unit automatically sets the LOW speed and cannot be changed.

- In ventilation and automatic mode the turbo speed cannot be selected.

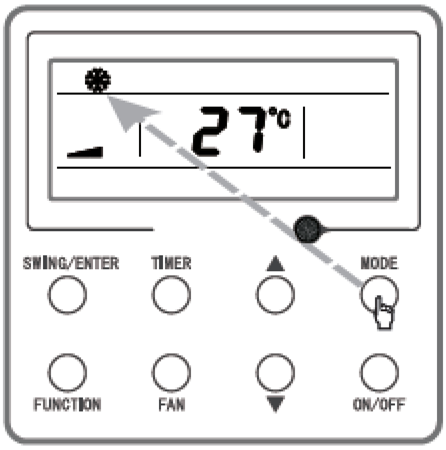


Fig.

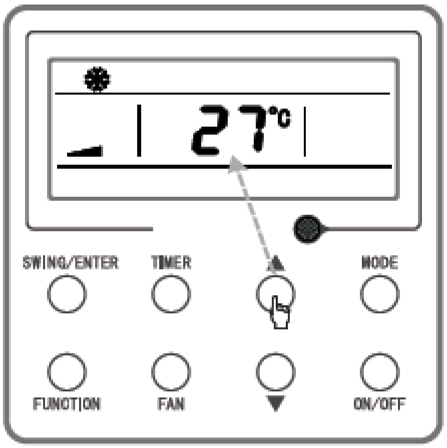


Fig. 6d

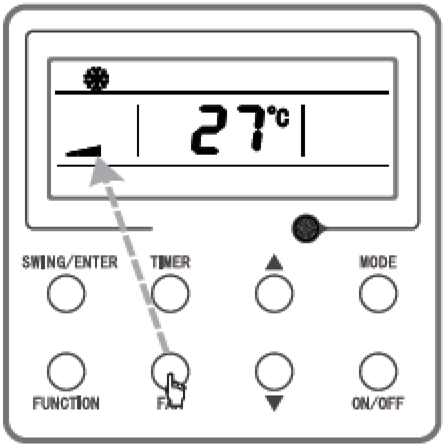
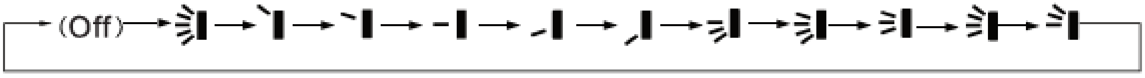


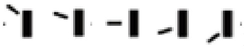
Fig. 6e

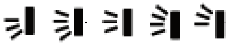
5. Press the SWING/ENTER button to set the direction of airflow from top to bottom:



The fins begin to oscillate: ppress the button to make the oscillation in the desired position.

: The fins oscillate automatically from top to bottom.


: the air is directed to the selected location.


: The air is directed towards the selected angle.

It is recommended to orient the fins upwards when the appliance is in cooling mode, downwards, however, when the appliance is in heating mode.

NOTE: Do not adjust the flaps with your hands during operation

6. Press the FUNCTION button to activate/deactivate the main functions of the air conditioner.

TIMER FUNCTION

When the air conditioning is off, you can set the "Timer On" power timer.
When the air conditioner is running, you can set the "Timer Off" switch-off timer.

"Timer OFF"
With the air conditioning running, press the "Timer" button, the unit activates the function and "xx.Hour" appears on the display with the words "Hour" and "OFF" flashing.
During flashing, within 5 seconds, press the "▲" or "▼" buttons (holding them for a long time, the time changes more quickly) to set the desired shutdown time.
Press the "Timer" button again to confirm the set time.

"Timer ON"
With the air conditioning off, press the "Timer" button, the unit activates the function and "xx.Hour" appears on the display with the words "Hour" and "ON" flashing.
During flashing, within 5 seconds, press the "▲" or "▼" buttons (holding them for a long time, the time changes more quickly) to set the desired power on time .
Press the "Timer" button again to confirm the set time.

Timer clearing: With the Timer function active , press the Timer button to disable the function.

INDOOR/OUTDOOR ROOM TEMPERATURE DISPLAY

When the unit is on or off, press and hold the SWING/ENTER button for 5 seconds to display the external ambient temperature (01) or the internal ambient temperature (02) on the wall control display. To switch from temperature 01 to temperature 02, simply press the MODE button.
If you do not press a button for 20 seconds while displaying the indoor/outdoor ambient temperature, the function is automatically abandoned.

SLEEP FUNCTION

This function, not available if the unit is operating in FAN (Ventilation) or AUTO (Automatic) mode, allows you to automatically adjust the temperature to make the room more comfortable at night.
With the machine switched on in air conditioning or dehumidification mode, if sleep mode is activated, the temperature control function will increase the temperature by 1h and 2h and maintain this value.1°C2°C
With the machine switched on in heating mode, if sleep mode is active, the temperature regulation function will decrease the temperature by 1h and 2h and maintain this value.1°C2°C

To activate the function, press the FUNCTION button when the unit is on, and when the control display displays the ☾ flashing symbol, press the SWING/ENTER button to confirm.
To deactivate the function, press the FUNCTION button again and, when the command display displays the symbol☾, press the SWING/ENTER button to confirm the deletion.
Nota: The "Sleep" function is deleted if the power supply to the unit is removed.

TURBO FUNCTION

During operation in Air Conditioning or Heating, this function allows you to reach the set temperature faster by activating the fan at a speed higher than the maximum.
When operating in air conditioning or heating mode, press the FUNCTION button and, when the control display displays flashing TURBO, press the SWING/ENTER button to confirm that the function is activated.
To deactivate the function, press the FUNCTION button again and, when the display displays the word TURBO, press the SWING/ENTER button to confirm the cancellation.
Note: The "Turbo" function is automatically deleted if the power supply to the unit is removed.

X-FAN FUNCTION

After operating in Air Conditioning or Dehumidification mode, when the indoor unit is turned off, condensation water remains inside it on the exchanger. The X-FAN function allows, if active, to work the fan at low speed for a few minutes (even if the air conditioner is then turned off) in order to dry the indoor unit from the humidity that forms inside it during normal operation in air conditioning and / or dehumidification.
When the unit operates in air conditioning or dehumidification mode, press the FUNCTION button and, when the control display displays the flashing X-FAN, press the SWING/ENTER button to confirm the activation of the function.
When the operation is complete, the function is automatically deactivated. Alternatively, you can manually deactivate it as follows: press the FUNCTION button again and, when the display displays the word X-FAN, press the SWING/ENTER button to confirm the cancellation.
Note: This function is only available in air conditioning or dehumidification mode.

QUIET FUNCTION

This function allows to further reduce the ventilation speed compared to the minimum adjustable speed and to reduce the power of the compressor, thus making the machine even quieter.
To activate the function, press the FUNCTION button until the 🎧 flashing icon appears and press SWING/ENTER to confirm. To deactivate the function, press the FUNCTION button until the flashing icon appears and press SWING/ENTER to confirm the 🎧 deletion.
Note: TheQuiet function cannot be activated for Fan and DRY Dehumidification operating mode.

HEATING FUNCTION 8°C

This function allows you to keep a set point in heating mode at 8 ° C so that the room temperature never drops below 8 ° C (useful in case of prolonged absence).
To activate the function, press the FUNCTION button (when the unit is on in heating mode) until the flashing icon appears and press SWING/ENTER to confirm. To deactivate the function, press the FUNCTION button until the flashing icon appears and press SWING/ENTER to confirm the deletion. 🏠🏠

KEYPAD LOCK FUNCTION

Press the ▲**e**▼ keys simultaneously for 5 seconds to lock the remote control keypad. If the keyboard is locked, the symbol 🔒 appears on the wall control display. With the keyboard locked, sand you press any key of the command the icon flashes but without sending the signal to the unit.
Press the ▲e▼ keys again at the same time to disable the keyboard lock.

FILTER CLEANING REMINDER (clean)

This feature, if enabled, reminds you to clean the filter of the indoor unit when the set usage time is reached.
1) To activate the function, press the FUNCTION button when the unit is on and select the filter cleaning option: the CLEAN icon starts flashing.
2) Press the ▲ or ▼ keys to set the desired filter duration level according to the following table.

Level 1		Level 2		Level 3	
SET	Hours	SET	Hours	SET	Hours
10	5500	20	1400	30	100
11	6000	21	1800	31	200
12	6500	22	2200	32	300
13	7000	23	2600	33	400
14	7500	24	3000	34	500
15	8000	25	3400	35	600
16	8500	26	3800	36	700
17	9000	27	4200	37	800
18	9500	28	4600	38	900
19	10000	29	5000	39	1000

3) At the end of the setting press the SWING / ENTER button to confirm the activation of the function.
4) When the set usage time is reached, the icon appears on the command display to remind you to clean the filter.
CLEAN At this point it is necessary to reset the message and restart the hour count from zero: press the FUNCTION button until the CLEAN function is selected and press the SWING / ENTER button to confirm.

NOTES:
- To deactivate the function, proceed as indicated in points 1) and 2) setting the SET value to **00** and confirm the deactivation by pressing the SWING/ENTER button.

WIFI FUNCTION

It allows you to activate / deactivate programming via WiFi (optional function that requires the purchase of a special module to be installed in the indoor unit).
When the unit is on, press the FUNCTION button repeatedly on the wall control until the symbol starts flashing on the control display. During flashing, use the 📶 ▲ or ▼ button on the command, select **On** to activate the function ("**Off"** in case of deactivation) and press the SWING/ENTER button to confirm the choice.

At this point the symbol remains fixed on the display (in case of deactivation the symbol disappears).

MEMORY FUNCTION - AUTOMATIC ANTI-BLACK-OUT RESET

When the unit is off, press the Mode and "▲" buttons simultaneously for 5 seconds to set or deactivate the anti-blackout function. If the function is active, the word MEMORY appears on the wall control and, in the event of a blackout and subsequent return of electricity, the machine returns to operation in the previous mode.
If the function is not active, the air conditioner remains switched off when the power returns.

TEMPERATURE DISPLAY IN °C or °F

When the unit is off, press the **MODE** and▼ keys simultaneously to change the displayed temperature from °C (Celsius) to °F (Fahrenheit) and vice versa.

During operation displays the set temperature. When you choose to display the indoor/outdoor ambient temperature using the remote control, the display displays it for a few seconds, after which it returns to display the set temperature. When the unit has an anomaly, the display displays the error code for the problem. If there are several errors at once, error codes alternate on the display.

For CSV 2418-3618-4818 HE32 models

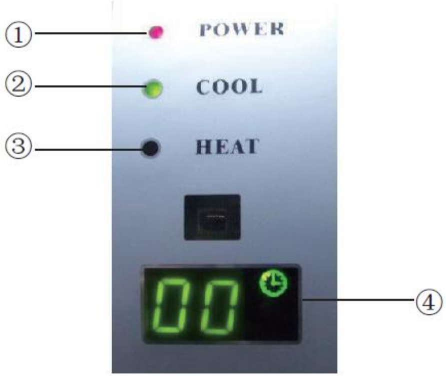
Car

Press the Auto button to start the air conditioner in automatic operation mode.
When the unit is on, press the AUTO button again to turn off the unit.

Test

Press the Test button to test the air conditioner.

LED INDICATIONS ON THE DISPLAY OF THE FSV FLOOR/CEILING UNIT



1) **Led POWER**
The indicator light is only on when the machine is electrically powered.

2) **COOL LED**
With the light on, indicates that the unit is active in cooling mode.

3) **Led HEAT**
With the light on, indicates that the unit is active in heating mode.

4) **Led Timer**
With the light on, indicates that the "Timer" function is active.

MAINTENANCE AND CLEANING

ATTENTION:

- Before performing any operation, disconnect the appliance or turn off the switch to remove the power supply and avoid the risk of electric shock.
- Do not carry out maintenance operations that require opening the appliance yourself, as the presence of live parts and the refrigerant contained in the cooling circuit make these operations particularly dangerous and involve risks of electrocute or cold burns.
-Do not spray water on the unit either directly or indirectly to avoid electrocution.
- Do not touch the air conditioner with damp hands to avoid the risk of electric shock.
- When cleaning the appliance do not climb on unstable tables or chairs to avoid falls from height.
-When removing filters, do not touch metal parts, especially the heat exchanger inside the indoor unit, to avoid cuts.

INSPECTIONS AT THE BEGINNING AND END OF THE SEASON

a) Pre-season inspection: check if fans are blocked, ground connections are closed, and if the filter is installed well.
The inlet and outlet parts of the air conditioner must not be obstructed, otherwise the operation of the Air conditioning will be affected with possible risks of breakage.
b) Inspection at the end of the season: press the off switch and remove the electrical plug; cover The outdoor unit with a plastic protection.

NOTE: If abnormal noise comes out of the air conditioner, turn off the unit immediately.
If the problem is due to the refrigeration system, contact a specialized technician.

PERIODIC MAINTENANCE

1. Clean the filters at least once a month (increase the frequency in particularly dusty environments) and relocate them in place.
2. If the day is sunny, operate the air conditioner in ventilation mode for a few hours so as to completely eliminate indoor humidity. In this regard, see the X-FAN function described in the paragraph dedicated to remote control and wall control.
3. Turn off the appliance or turn off the circuit breaker if you do not use the appliance for a long time.

MALFUNCTION OF THE AIR CONDITIONER

1. If the air conditioner shows no signs of life, check the supply voltage and make sure that:
    - the plug of the appliance is completely inserted into the socket;
    - the circuit breaker is not electrocuted or defective;
    - there has been no interruption of electricity.
2. If the cooling or heating effect seems lower than normal, check whether:
    - the temperature has been set correctly on the remote control;
    - doors or windows have been opened;
    - the outdoor unit is directly exposed to the sun;
    - filters are clogged;
    - there are obstacles obstructing the free circulation of air in the indoor or outdoor unit.

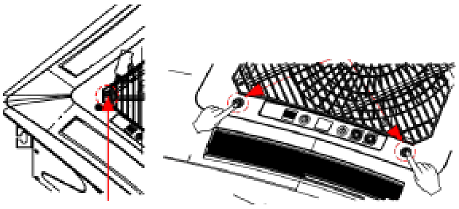
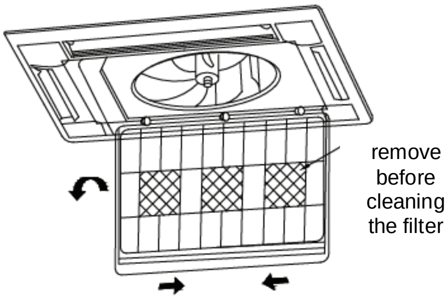
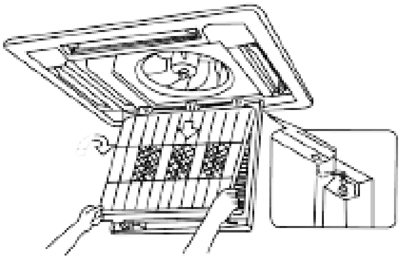
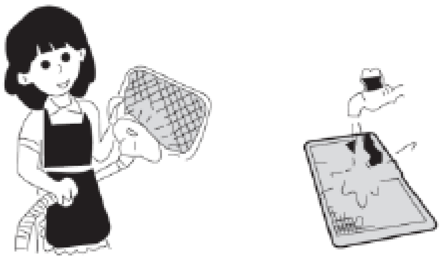
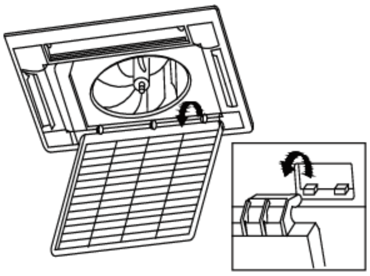
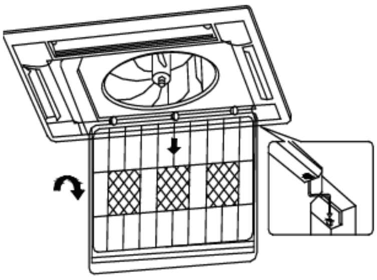
CLEANLINESS

Remote control:Use only a dry cloth. Do not use water or glass cleaning products.
Air conditioner: use only a dry cloth. For persistent stains use a diluted neutral detergent in water and dry the unit.

Warning: - Do not use gasoline, benzene, solvents and cleaning products.
- Water at a temperature above 40°C could cause discoloration or deformation.

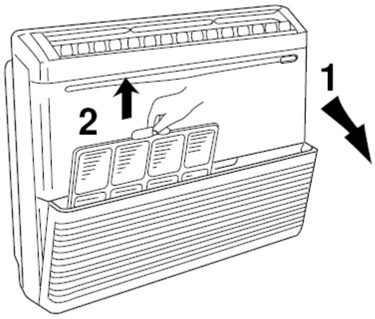
CLEANING THE AIR FILTER

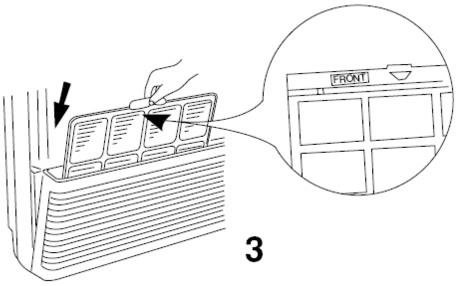
CASSETTE MODEL - CSV

 A)	 B)	 C)
 D)	 E)	 (f)

1) Remove the screws on the air inlet grille and press on the latches positioned on the grate until it opens (fig. A).
2) Lower the grid slowly (fig. B).
3) Pull the lever behind the air inlet grille, lift it and disassemble the filter (fig. C).
4) Clean the filter with a vacuum cleaner. In the presence of oily powder wash with warm soapy water, rinse and allow to dry (fig. D).
If necessary, clean the grid (fig. E) with a brush, using water and a mild detergent, then rinse and dry .
5) Reinsert the filter correctly in its seat inside the grid, push the lever inwards behind the grid to fix the filter, close the grid by sliding the two latches outwards and reassemble the screw that blocks the latch on both sides (fig. F).

FLOOR/CEILING MODEL - FSV

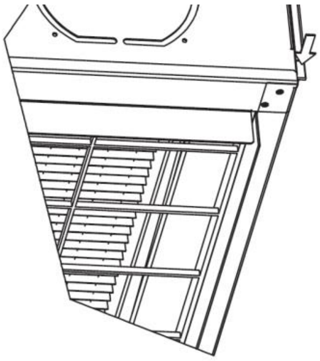




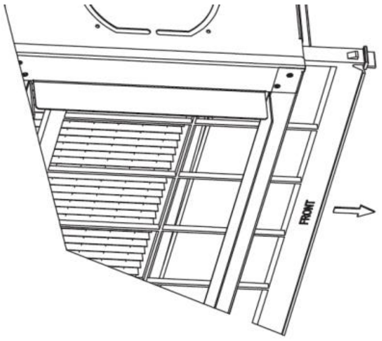
1) Remove the protective screws placed on the air inlet grille panel and pull the panel towards you.
2) Carefully pull out the filter upwards. Clean it with a vacuum cleaner. In the presence of oily powder wash with warm soapy water, rinse and allow to dry (Fig. 1-2).
3) Reinsert the filter into the unit, making sure that the word FRONT is facing Voi (Fig. 3) and close the intake grid panel.

DUCTABLE MODEL - DSV

❶



❷



1) Grasp the filter for the tab (Fig.1).
2) Pull it out to the right or left side (Fig. 2).
3) Clean the filter with a vacuum cleaner. In the presence of oily powder wash with warm soapy water, rinse and allow to dry.

REMARKS

Defrosting

When the outside temperature is low, frost or ice can form on the external heat exchange coil, reducing heating performance. In this case, the defrost system controlled by the microprocessor comes into action.

At the same time, the indoor unit fan stops (or in some cases spins at very low speed) and the "DEFROST" light or alarm code H1 appears on the display until defrosting is complete.

The heating operation then starts again after a few minutes. (This range varies slightly depending on the outside temperature and how ice forms.)

Hot Start Fan Control

For a few minutes after the start of the heating operation, the internal fan does not start spinning (or, in some cases, spins at very low speed), until the heat exchange battery of the indoor unit has heated up sufficiently. This is due to the operation of the cold draught prevention system.

MALFUNCTIONS

In particular conditions, the air conditioner may have malfunctions that are often apparent or determined by accidental or, more often, trivial causes.

Attention!

Before requesting the intervention of the service center it is advisable to perform easy checks both to take advantage of the air conditioning performance continuously and to the fullest, and to avoid unnecessary assistance interventions. If after checking the following list the air conditioner does not work normally, turn it off and contact the distributor or installation technician for repair.

ANOMALY		**CAUSE AND REMEDY**
The air conditioner does not work		1) A power outage has occurred, so power is restored. 2) The life-saving residual current circuit breaker intervened. 3) The supply voltageis insufficient: contact an electrician or the service center. 4) Check that the operation button is set to ON. 5) The remote control or the re drop pumpis not working properly: contact your dealer. 6) Check that the batteries of the remote control are charged. 7) Compressor protection:once turned off and immediately on again, the air conditioner starts with a delay of a few minutes for safety reasons.
Poor efficiency duringcooling or heating		1) Check that the air filter is not dirty or clogged and, if necessary, clean it. 2) In the room there is a heat source or there are many people. 3) Check that there are no doors and/or windows open 4) Check that theair inlet and outlets are not obstructed. 5) Check that the temperature and ventilation speed are correctly set. 6) The defrost system does not work: contact the service center.
Escape of an unusual odor from the air outlets after switching on the air conditioner		This anomaly occurs because the odors present in the room have been absorbed by the air conditioner or by stagnation of condensate water in the pipe or in the condensate collection tank. Also check the cleanliness status of the filters.
Presence of a noise similar to the flow of water with working air conditioning		The noise is due to the circulation of coolant inside the appliance. It is a normal condition.
Leakage of a mist of water vapor during Air cooling function		Rapid cooling of the room causes cold air to escape, which resembles a fog.
Body creaks both in air conditioning and heating		With the variation of the temperature, the plastic parts undergo expansions that cause this inconvenience. It is a normal condition.
The remote control does not send the signal to the air conditioner		- Check if there is magnetic or electrical interference near the air conditioner that can affect the functionality of the remote control. In this case, unplug the power supply and reinsert it. - Is it in its reception field? Are there obstacles in its range? Are the batteries empty? - The remote control may be damaged.

ALARM CODES

In the event of an anomaly, the display of the air conditioner (or the flush control for ductable models) displays an error code. In case of multiple errors, these will be displayed sequentially. Refer to the following error code page.
ATTENTION: in case of an error code, turn off the unit and contact your trusted installer.

CODE	**ANOMALY DESCRIPTION**
C5	Malfunction jumper connector on internal board. Contact the qualified technical center.
E1	Overpressure protection. Restart the air conditioner to eliminate the problem. If the alarm code remains displayed, contact the qualified technical center.
E6	Communication error. Restart the air conditioner to eliminate the problem. If the alarm code remains displayed, contact the qualified technical center.
E8	Internal fan error. Restart the air conditioner to eliminate the problem. If the alarm code remains displayed, contact the qualified technical center.
F0	Defect air temperature sensor indoor unit. Contactthe qualified technical centre.
F1	Defect sensor battery evaporator indoor unit. Contactthe qualified technical centre.
F2	Defect sensor condensing battery outdoor unit. Contactthe qualified technical centre.
F3	Defect external air temperature sensor. Contactthe qualified technical centre.
F4	Defect compressor drain temperature sensor. Contactthe qualified technical centre.
F5	Defect temperature sensor flush control. Contactthe qualified technical centre.
H3	Compressor overload protection. Restart the air conditioner to eliminate the problem. If the alarm code remains displayed, contact the qualified technical center.
H6	Internal fan error. Restart the air conditioner to eliminate the problem. If the alarm code remains displayed, contact the qualified technical center.

OTHER ERROR CODES

CODE	ANOMALY
E2	Frost protection
E3	Low Compressor Pressure/Refrigerant Charge Defect
E4	High compressor discharge temperature
E9	Float protection condensate drain pump
EE	Internal or external drive memory chip malfunction
EL	Emergency stop (fire alarm)
H4	Generic external drive overload
H5	IPM protection inverter module external unit
H6	External fan DC motor error
H7	Compressor motor desynchronization
Hc	Power filter card protection
Lc	Compressor start error
Ld	Compressor phase sequence loss
LF	Power card in alarm
LP	Mismatch between indoor and outdoor unit

CODE	ANOMALY
P0	Power card reset
P5	Overcurrent protection
P6	Communication anomaly between main board and inverter board
P7	Temperature sensor anomaly IPM inverter board or PFC filter board
P8	IPM inverter board overtemperature
P9	AC side power protection
PA	AC side power protection
PC	Power card power alarm
Pd	Faulty temperature sensors
PF	Electrical panel sensor anomaly
PH	High voltage protection DC Bus cable
.PL	Low voltage protection DC Bus cable
PP	AC input voltage anomaly
PU	Electrolytic capacitor defect
U7	4-way valve failure

MODEL COMBINATION

Combine Indoor and Outdoor Unit only as listed below.

MODEL	INTERNAL UNIT	EXTERNAL UNIT
Duct	DSV1218HE32	MSV1218HE32
	DSV1818HE32	MSV1818HE32
	DSV2418HE32	MSV2418HE32
	DSV3618HE32	MSV3618HE32
	DSV4818HE32	MSV4818HE32
	DSV6018HE32	MSV6018HE32
Cassette	CSV1818HE32	MSV1818HE32
	CSV2418HE32	MSV2418HE32
	CSV3618HE32	MSV3618HE32
	CSV4818HE32	MSV4818HE32
Floor-ceiling	FSV1818HE32	MSV1818HE32
	FSV2418HE32	MSV2418HE32
	FSV3618HE32	MSV3618HE32

OPERATING LIMITS

Conditions	Cooling	Heating
Outdoor air temperature °C B.S.	-2048~	-2024~
Indoor air temperature °C B.S./B.U. (max)	32/23	27/--

IN CASE OF INCORRECT OR IMPROPER INSTALLATION
ECA Technology Srl will not be responsible for damage caused to people, things or animals and for any damage to the air conditioner for failure to comply with the installation instructions on this manual.

INSTALLATION NOTES

This appliance contains environmentally friendly but potentiallyunrealistic R32 gas (see chapter "REFRIGERANT" on p. 4 4. Improper use of the unit can cause serious damage to persons and/or property.
It is recommended that installation and maintenance are carried out only by qualified personnel in possession of therigorous license to be able to operate correctly and safely with flammable refrigerants.

To install the air conditioner in maximum safety and avoid operating problems, **readthe instruction manual carefully before starting** and strictly follow the following points:

- Bring up some personalprotective equipment .
- Make sure the power supply is turned off.
- Strictly observe local and national electrical regulations.
- Use specific copper refrigeration pipes.
- During installation, first connect the refrigerant circuit and then the electrical one, proceed in reverse in the case of removing the units.

ELECTRICAL CONNECTION OF THE SYSTEM

AVVERTIMENTO

AN ELECTRIC SHOCK CAN CAUSE SERIOUS INJURY OR DEATH.
ONLY QUALIFIED PERSONNEL CAN PERFORM THE ELECTRICAL CONNECTION OF THE SYSTEM.

- Electrical connections must be made by a specialized electrician.
- Do not power the unit until all cables and hoses are completed or reconnected and checked to ensure grounding.
- Highly hazardous electrical voltages are used in this electrical circuit. Refer to the wiring diagram and these instructions when connecting. Improper connections and inadequate grounding can result in **accidental injury or death**.
- The air conditioner belongs to class I appliances, therefore **grounding (** yellow-green wire that can only be used for grounding) must be carried out according to local electrical regulations. Check that the appliance is always connected to the ground correctly, otherwise electric shock may occur.
- Secure the cables tightly. Inadequate connections can cause overheating and a possible fire.
- Electrical cables must not come into contact with refrigerant pipes, compressor or moving parts of the fan.
- When connecting power and control lines, do not use multi-conductor cables. Use separate cables for each line type.

CONNECTION OF REFRIGERATION PIPES

- Ventilate the area if refrigerant leaks occur during installation. Prevent any refrigerant leaks from coming into contact with hot parts or open flames and releasing toxic gases.
- The length of the coolant pipes between the indoor and outdoor unit should be as short as possible.
- **Install the indoor unit respecting the maximum altitude difference values (H) both above and below the outdoor unit and the maximum distance values (L) from it (See Table on page 45 for details).**
- Use the pipe folder link method.
- Apply coolant oil to the contact surfaces of the folders, then tighten the torque wrench connections, following the torque values shown in the manual.
- Carefully check for leaks before the test test.

IF THE INSTALLATION TAKES PLACE...

... IN A ROOM

Carefully insulate each pipe in the room to prevent condensation that could cause dripping and, consequently, cause damage to walls and floors.

... IN DAMP OR IRREGULAR PLACES

Use a solid base raised above the ground to prepare the Outdoor Unit.
This will avoid damage and abnormal vibration.

... IN LOCATIONS SUBJECT TO STRONG WINDS

Securely anchor the outdoor unit with bolts and a metal frame. Provide a suitable air baffle.

... IN PLACES SUBJECT TO SNOWFALL

Install the Outdoor Unit on a platform higher than the snow accumulation level.

DURING REPAIRS

- Remove voltage (from the main switch) before opening the unit to check or repair electrical parts.
- Keep hands and clothes away from any moving part.
- Clean after finishing the work, checking that you have not left metal scraps or pieces of cable inside the unit.
- Ventilate the room during installation and testing of the refrigerant circuit; Also make sure that, once the installation is complete, there is no leakage of refrigerant gas as contact with flames or heat sources can be toxic and very dangerous.

PLACE OF INSTALLATION INDOOR UNIT

⚠ **PRECAUZIONE**

AVOID:

- Places where gas leaks, liquid spills or oil may occur
- Excessively sunny places
- Proximity to heat sources that reduce the potential of the air conditioner
- Places with a high degree of salinity.
- Places with the presence of high-frequency waves, electromagnetic fields, for example, near radio sets, welding machines and medical equipment.
- Other special environments with vapor fumes, dusty environments, etc.
- Places intended to contain potentially explosive, flammable, toxic material.

VERIFY:

- The most appropriate position to ensure proper airflow throughout the room.
- Choose a location where the ceiling is able to withstand the weight of the unit.
- Install the unit so that the distance between the two sections is as small as possible.
- Leave sufficient space around the unit for operation and maintenance and do not obstruct the flow of air around the intake and distribution grilles.
- **Install the indoor unit respecting the maximum values of difference in height (H) both above and below the outdoor unit and the values of maximum distance (L) from it (See Table on p. 45 for details).**

INSTALLATION OF DUCTED INDOOR UNIT - DSV

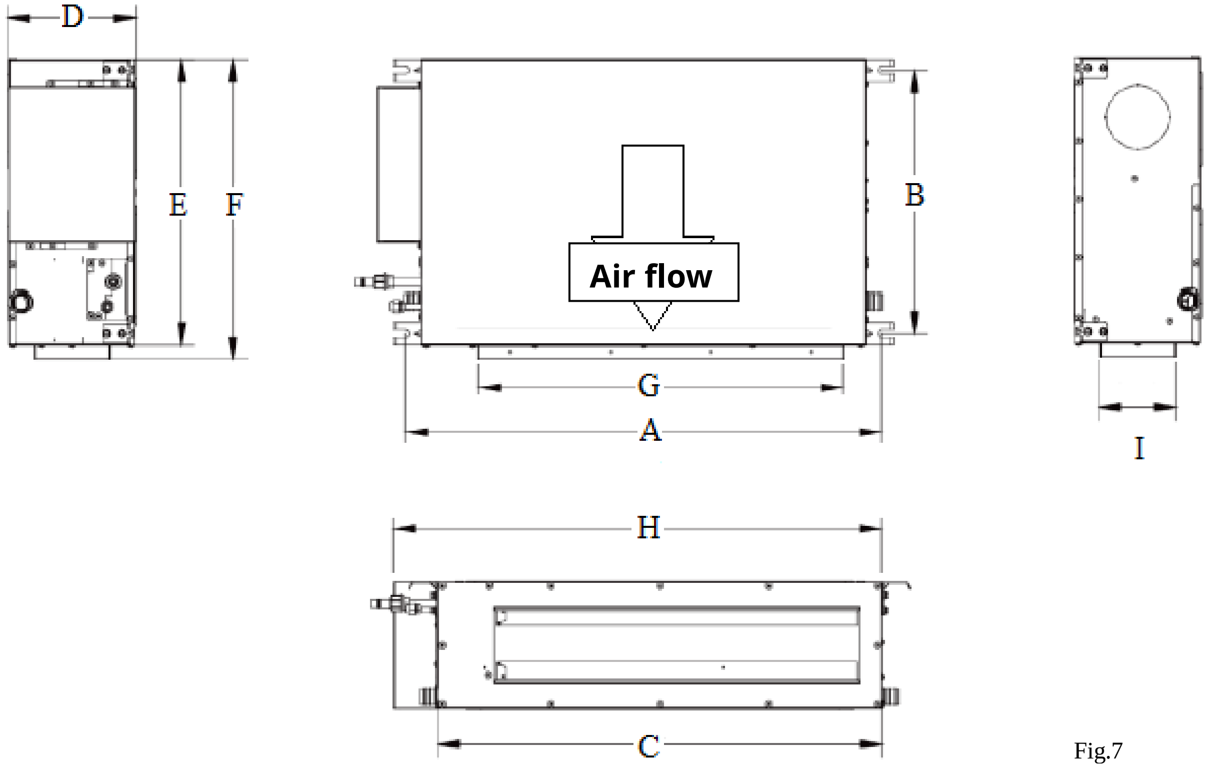


Fig.7

Model		**A**	**B**	**C**	**D**	**And**	**F**	**G**	**H**	**The**	**Liquid line**	**Gas line**
DSV1218HE32	Mm	760	415	700	200	450	474	585	768	122	1/4"	3/8"
DSV1818HE32	Mm	1060	415	1000	200	450	474	885	1068	122	1/4"	1/2"
DSV2418HE32	Mm	1360	415	1300	220	450	474	1185	1368	142	3/8"	5/8"
DSV3618HE32	Mm	1040	500	1000	300	700	754	746	1092	195	3/8"	5/8"
DSV4818HE32	Mm	1440	500	1400	300	700	754	1150	1492	195	3/8"	5/8"
DSV6018HE32	Mm	1440	500	1400	300	700	754	1150	1543	195	3/8"	5/8"

AIR DISTRIBUTION

The thermal efficiency of the air conditioners, with relative air flow, can meet the thermal needs of one or more rooms depending on the potential of the machine.

During installation, it is essential that the plant designer verifies the real thermal load, both global and of the single room, in order to identify the most suitable model for the request (summer and winter) and correctly determines the distribution ducts (including the delivery and return nozzles) according to the static pressure available at the delivery mouth of the machine.

NOTE

Each room directly affected by the air flow in delivery must be equipped with a return air transit grid (passage section calculated for V. air = 5 ÷ 2 m / sec.) or equivalent system: the exception is obviously the environment without internal closing elements.

ATTENTION

It is good technique to install an anti-vibration coupling at the connection of the indoor unit, in order to avoid the transmission of noise through the ducting, and to couple the ducting to the joint with bayonet connections.

MINIMUM SPACE FOR INSTALLATION AND LA MANUTENZIONE

- This air conditioner is normally installed above the false ceiling in an invisible position. Only the intake and air delivery grilles are installed in the brush of the false ceiling.
- The minimum space for installation and maintenance are represented in the table.
- It is recommended that for checks and maintenance of electrical and mechanical parts, it is necessary to set up an inspection door from which it is possible to operate on the machine.
- Place the air conditioner in a position that allows you to easily carry out routine maintenance (filter cleaning) as well as extraordinary maintenance.

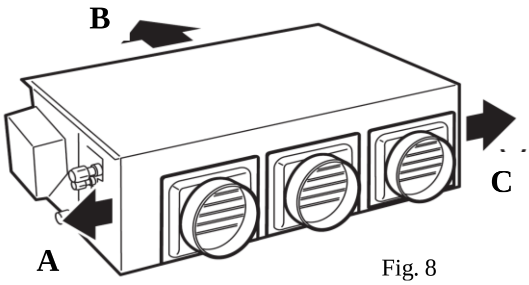


Fig. 8

Model		**A**	**B**	**C**
DSV1218-1818HE32	Mm	200	300	500
DSV2418HE32	Mm	500	300	350
DSV3618HE32	Mm	500	400	350
DSV4818HE32	Mm	350	400	500
DSV6018HE32	Mm	350	600	600

⚠ PRECAUZIONE

The lower part of the indoor unit is equipped with a hatch for any maintenance. Due consideration should be given to this fact when installing the air conditioner.

INDOOR UNIT PLACEMENT

The indoor unit is intended for hanging installation and for this purpose is equipped with brackets at 4 corners.
The installation can be both in false ceiling and in a room adjacent to the air-conditioned environment.

ATTENTION

Both in the case of false ceiling to the indoor unit, and positioning of the same in a room separate from the one involved in the air supply, it is essential to ensure sections of passage of the intake air not lower than the values indicated in the project.

FIXING THE INDOOR UNIT

1) Choose the installation position and place 4 threaded bars 10/16 MA on the ceiling respecting the interaxis, using a drill bit suitable for the material to be drilled (concrete, wood, etc.) .

It is important to carry out the operations of attaching the unit to the ceiling with extreme care. Make sure that the ceiling is able to support the weight of the indoor unit. Test the strength of each tie rod before securing the unit.

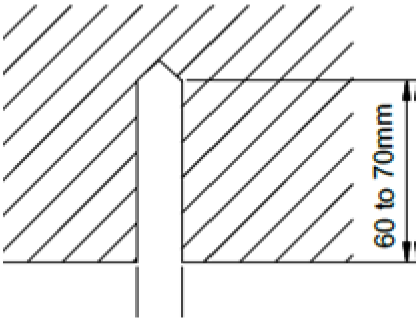


Fig. 10

2) Insert the expansion plugs or inserts as indicated in the holes and completely introduce the threaded bar heads, inside the anchor dowels.

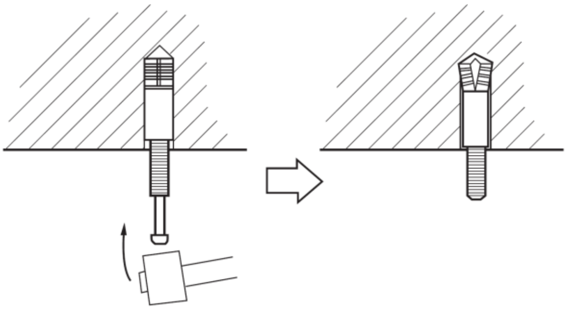
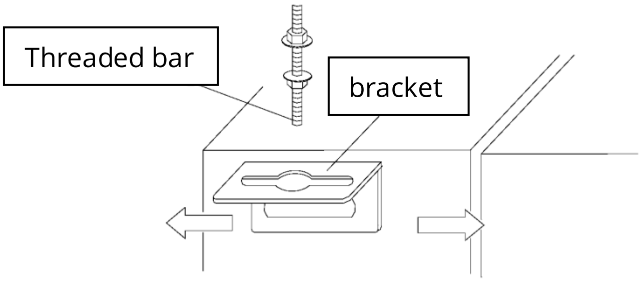


Fig. 11th



3) Install theanchoring brackets of the indoor unit.

Fig. 12

4) Secure the unit by passing the threaded bars through the holes prepared and by means of nuts and washer lockit in the desired position (fig.13).

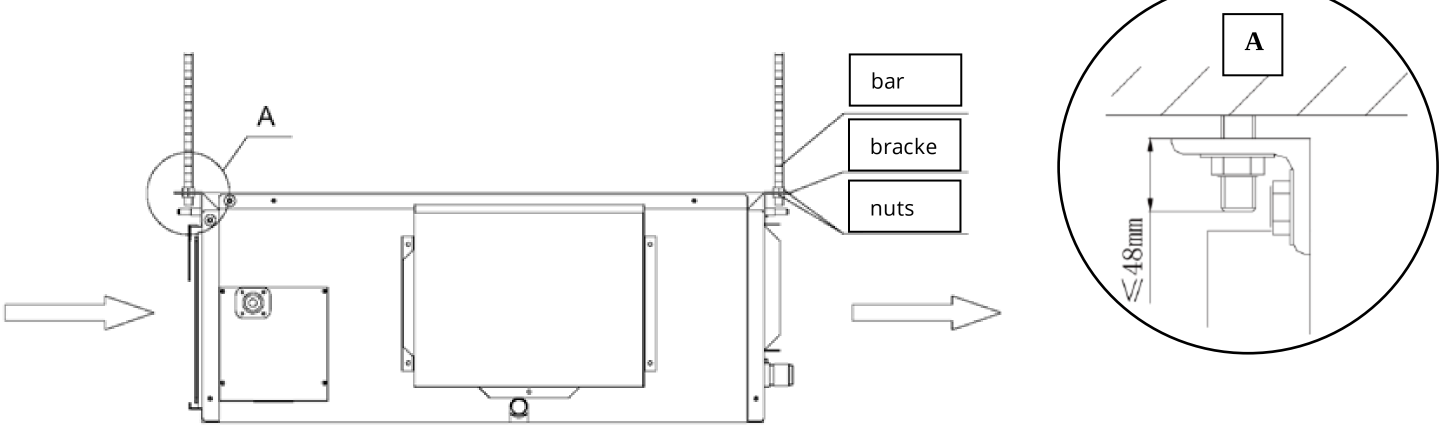


Fig. 13th

PRECAUZIONE

Check by bubble level that the air conditioner is fixed to the ceiling with a slight slope towards the condensate drain, to ensure the correct flow of condensate.

CONDENSATE DRAIN PIPE INSTALLATION

- Insert a condensate drainage pipe to the hose holder ø .32 mm
- Use a plastic tube rigid enough to prevent crushing in the curvatures.
- Hook the hose to the drain and lock it with a suitable hose clamp clamp
- Insulate with an insulating sheath with a thickness of 9 mm the entire section of pipe inside the house to avoid the possibility of dripping resulting from condensation outside the pipe.
- Check for the absence of siphons or against slopes near the indoor unit.
- Do not tilt the pipe upwards near the drainage connection of the unit. This could result in backflow when the unit shuts down and resulting in water leakage.
- Do not apply excessive strain to the attachments of the unit when connecting the drainage pipe.
- Support the pipeline with suitable supports placed as close as possible to the unit.

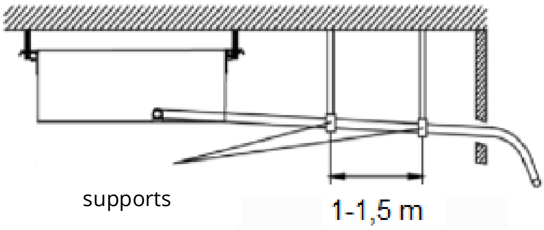


Fig. 14th

PRECAUZIONE

Place the condensate water drain in a position that is not harmful to people or things.
It is advisable to have the possibility of visual inspection of the drain at the end of the pipe or insert a transparent piece in the pipe itself when it flows into a drain that cannot be inspected.

An exhaust system must provide an adequate siphon to prevent unwanted air entering the vacuum system.
This siphon is also useful to avoid the infiltration of odors and insects.
The sizing and execution of the siphon must ensure that A = B ≥ P+20mm, where P expressed in mm is equal to the useful static pressure of the installed machine.

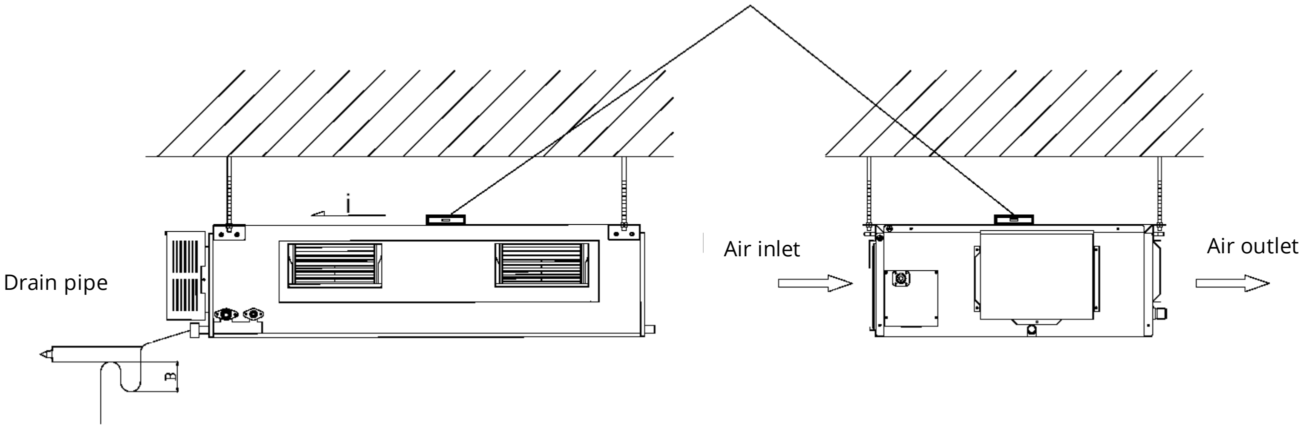


Fig. 15

PRECAUZIONE

Check by bubble level that the air conditioner is fixed to the ceiling with a slight slope towards the condensate drain, to ensure the correct flow of condensate.

CONDENSATE DRAIN VERIFICATION

To the hose holder of the condensation water collection tank of the indoor and outdoor unit it is necessary to connect a drain pipe in order to convey the condensate to the desired place both outside and inside the house.

Before making the connection it is advisable to check, pouring water into the drip basin below the finned battery of the indoor unit, the correct functionality of the drain and the absence of water leaks of the joints.

INSTALLATION OF INTERNAL CASSETTE UNIT - CSV

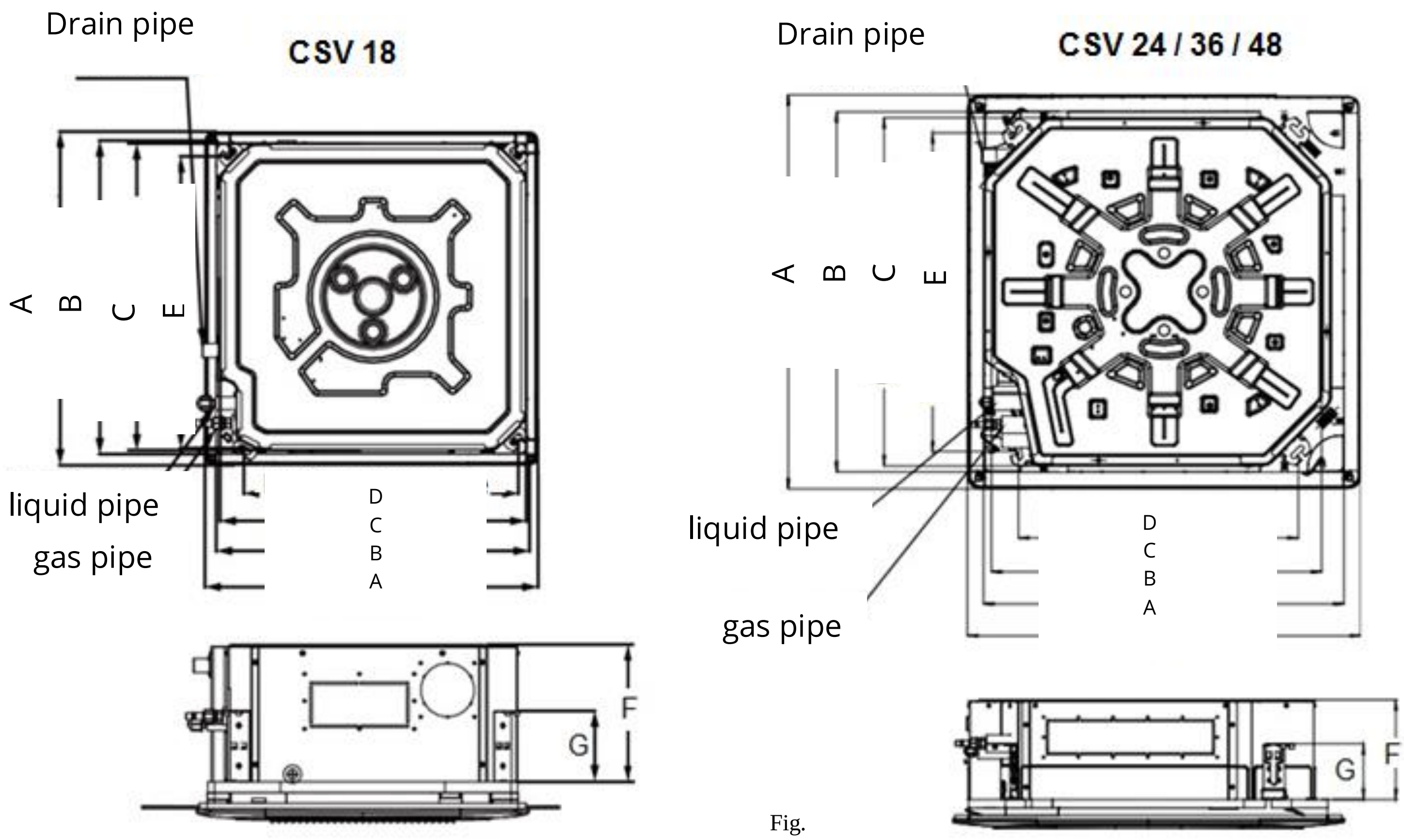
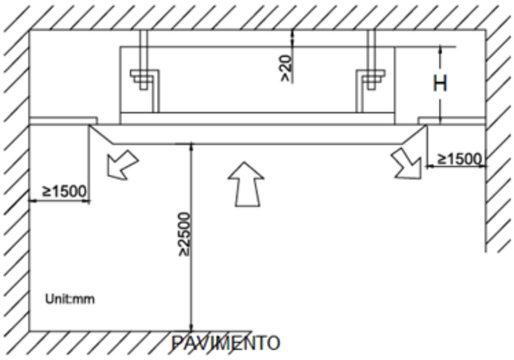

Drain pipe
CSV 18
A
B
C
E
liquid pipe
gas pipe
D
C
B
A
F
G
Drain pipe
CSV 24 / 36 / 48
A
B
C
E
liquid pipe
gas pipe
D
C
B
A
G
F

Fig. 16

Model		A	B	C	D	And	F	G	Liquid line	Gas line
CSV1818HE32	Mm	620	580	570	505	550	265	140	1/4"	1/2"
CSV2418HE32	Mm	950	870	840	680	780	240	135	3/8"	5/8"
CSV3618HE32	Mm	950	870	840	680	780	240	135	3/8"	5/8"
CSV4818HE32	Mm	950	870	840	680	780	290	135	3/8"	5/8"

MINIMUM RECOMMENDED INSTALLATION DISTANCES

The indoor unit must be installed on the ceiling at 2.5- height3 metri.


>20
H
≥1500
≥1500
≥2500
Unit:mm
PAVIMENTO

Modello	H(mm)
CSV1818	295
CSV2418	270
CSV3618	270
CSV4818	320

Fig. 17th

CHOOSING AN INSTALLATION LOCATION

1. Avoid obstructing the air inlet and outlet openings of the indoor unit, so as to ensure proper air circulation throughout the room.
2. Choose a flat installation media that can support 4 times the weight of the indoor unit (if not, reinforce the stand before installation) and does not cause an increase in operating vibrations.
3. Choose a place of installation that allows easy drainage of condensate water.
4. Leave enough space for cleaning and maintenance.
5.Overlapping sections between the ceiling and the decorative panels shall measure at least 20 mm.

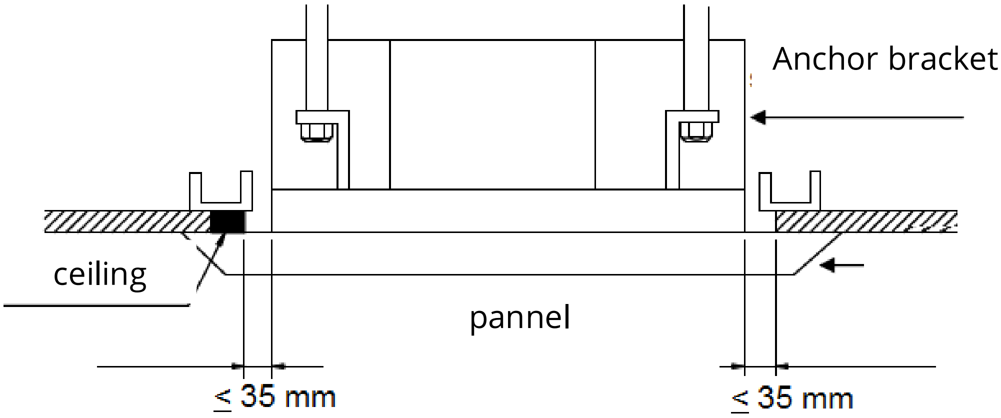


Fig. 18

In thecase in which the room is equipped with a ceiling it is necessary to drill holes for installation.
- For the size of the holes to be drilled on the ceiling, refer to the installation template.
- Smark the center of the hole to be drilled on the ceiling on the installation template.

- Before installation, connect all pipes (coolant, condensate drain) and electrical cables (connection between indoor and outdoor units) to the indoor unit.
- Drill the hole in the ceiling; It is advisable to use a frame to ensure a smooth surface and to prevent vibrations.

1. Install M10 anchor bolts (the distance between different holes is marked on the paper mounting template). Anchor bolts must be used in the case of rooms already ceilings. If the ceiling is new, use interior fischer.

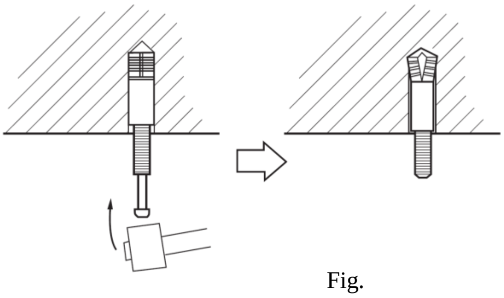


Fig. 19

2. Temporarily install the indoor unit. Insert the anchor brackets into the anchor bolts. Be sure to insert a washer and a nut on the endsof each bracket.

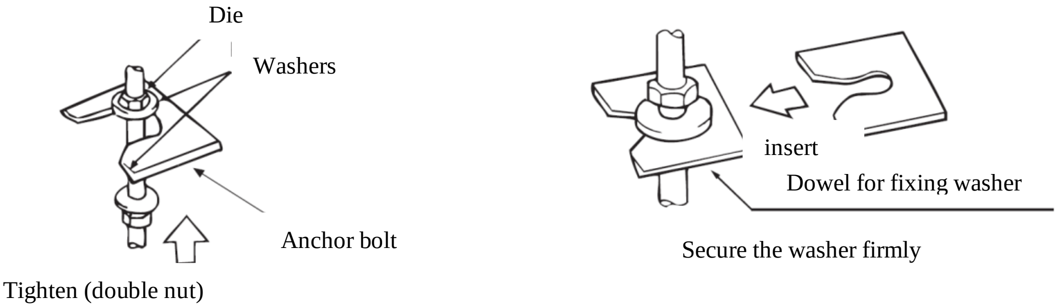
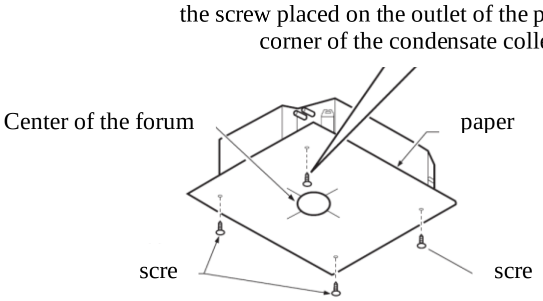


Fig. 20

3. Apply the installation template on the unit (the center of the template must be in the center of the unit) using 3 bolts and fix the corner of the condensate collection tray to the outlet hole of the pipes.


the screw placed on the outlet of the pipes is fixed to the corner of the condensate collection tank
Center of the forum
paper
scre
scre

Fix the paper template

Fig. 21st

4. After installation on the ceiling, adjust the luminaire to the correct position.
5. Verify that the drive is level.

- Check the leveling at the four corners using a
  Level or a vinyl pipe filled with water.
- The indoor unit contains a condensate drain pump and a
  float switch, so make sure you do not tilt
  The appliance. If the luminaire is tilted to the side
  opposite of condensate drain pipe, switch A
  Float does not work properly and moreerdite occurs.

6. Remove the washers and tighten the nuts above, then
   Remove the paper mounting template.

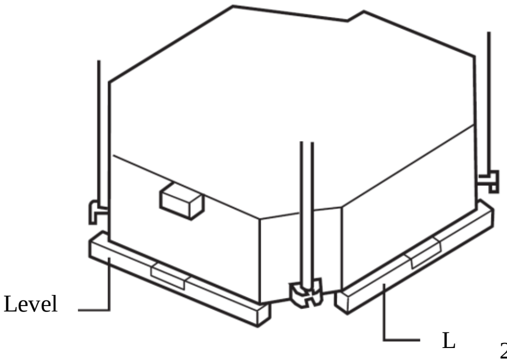


Fig. 22nd

CONDENSATE DRAIN PIPE INSTALLATION

- The diameter of the condensate drain pipe must be equal to or greater than that of the pipes of the indoor unit (external diameter pipe).32 mm
- The condensate drain pipe must be short and installed with a downward slope of at least 1/100 to prevent the formation of air bubbles. Avoid making itor passing through a higher pointand causing siphons.
- Keep a distance of 1- between the support brackets1,5 mso that the tube stands straight and does not have curvatures.

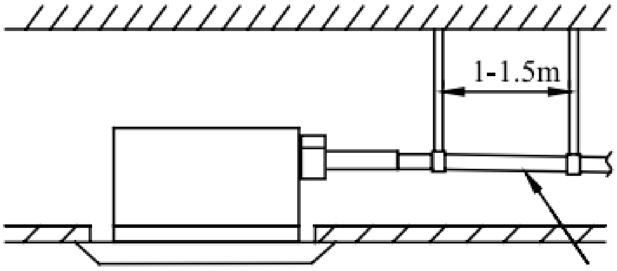


Fig. 23 - Correct piping

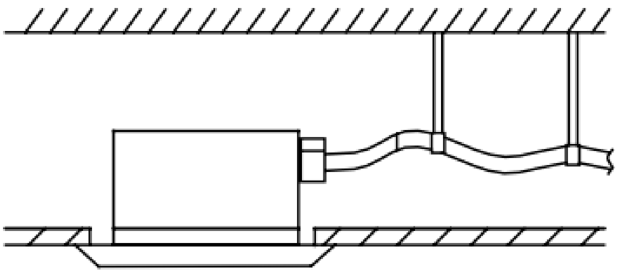


Fig. 24 - Incorrect piping

- Attach the rigid tube to the unit using a cable tie
  Hose clamp. Insert the drain hose inside the drain hole
  condensation.
- Wrap an insulation sheet around the tie to seal it
  to the condensate drain pipe. Insulate pipes
  condensate drain inside the room.

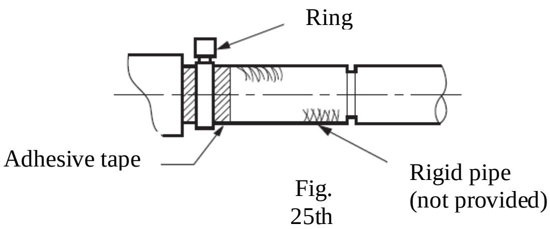

Ring
Adhesive tape
Rigid pipe
(not provided)

Fig. 25th

PRECAUZIONE If necessary, immediately after opening the drain it is possible to go up with the pipe for a maximum difference in height of . Do not exceed the recommended difference in height; Larger ascents could cause water leakage. The height of the exhaust head can be raised to a maximum of 280 mm500 mm above the ceiling (Fig.26).

- The tube should form a right angle to the unit, at a distance from it300 mm (Fig.26).
- The maximum slope of the condensate drain pipe must be 75 mm (Fig.27).
- If condensate drain pipes are to be provided for more than one indoor unit, place the common pipe approximately below the condensate drain opening of each unit100 mm (Fig.28).

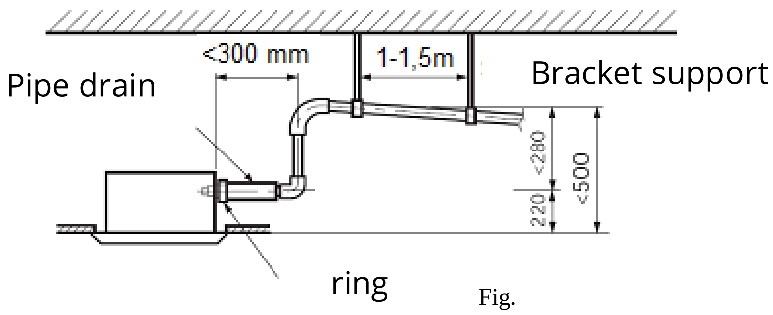


Fig. 26th

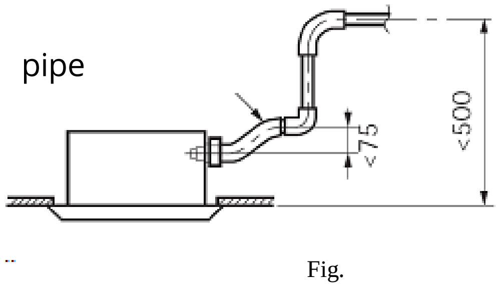


Fig. 27th

When you need to connect several drain pipes, perform the installation as follows.

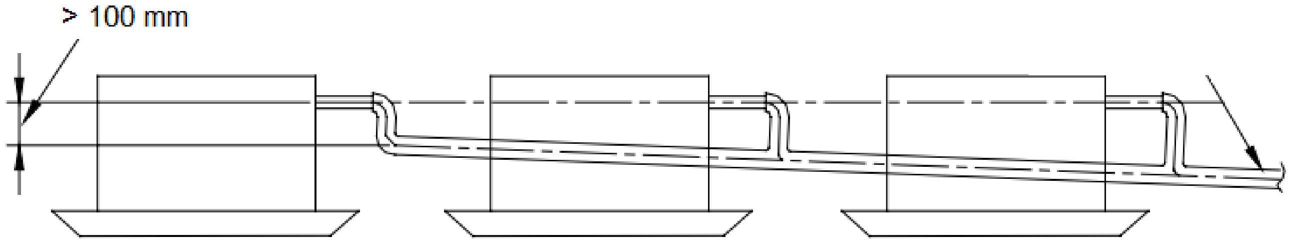


Fig. 28th

- Once the installation is complete, perform a test to verify that the condensate flows properly into the pipes and that the connections do not leak water. Slowly pour 600 cc of water from the deflector or inspection hole into the drain hose.
- Perform the drainage test in cooling mode after installation of the electrical circuit.

INSTALLATION OF CASSETTE PLAFONATION GRID - CSV

- Apply the grid to the body of the indoor unit by matching the position of the fin motor with the position of the condensate pipe of the indoor unit as shown in fig. 30.
- Install the ceiling grille.

1. Temporarily hang the ring, located on the opposite side of the fin motor, on the hook of the indoor unit.
2. Temporarily hang the remaining two rings on the hooks on either side of the indoor unit (provided that the fin wire should not get stuck).
3. Screw all 4 hexagonal bolts located under the rings for approximately (the grid will rise). 15 mm
4. Arrange the grid by turning it to in the direction indicated by the arrow, adapting it to the machine and the hole (fig. 30).
5. Fasten the bolts until the thickness of the sealing material between the grid and the indoor unit is reduced to 5-8 mm.

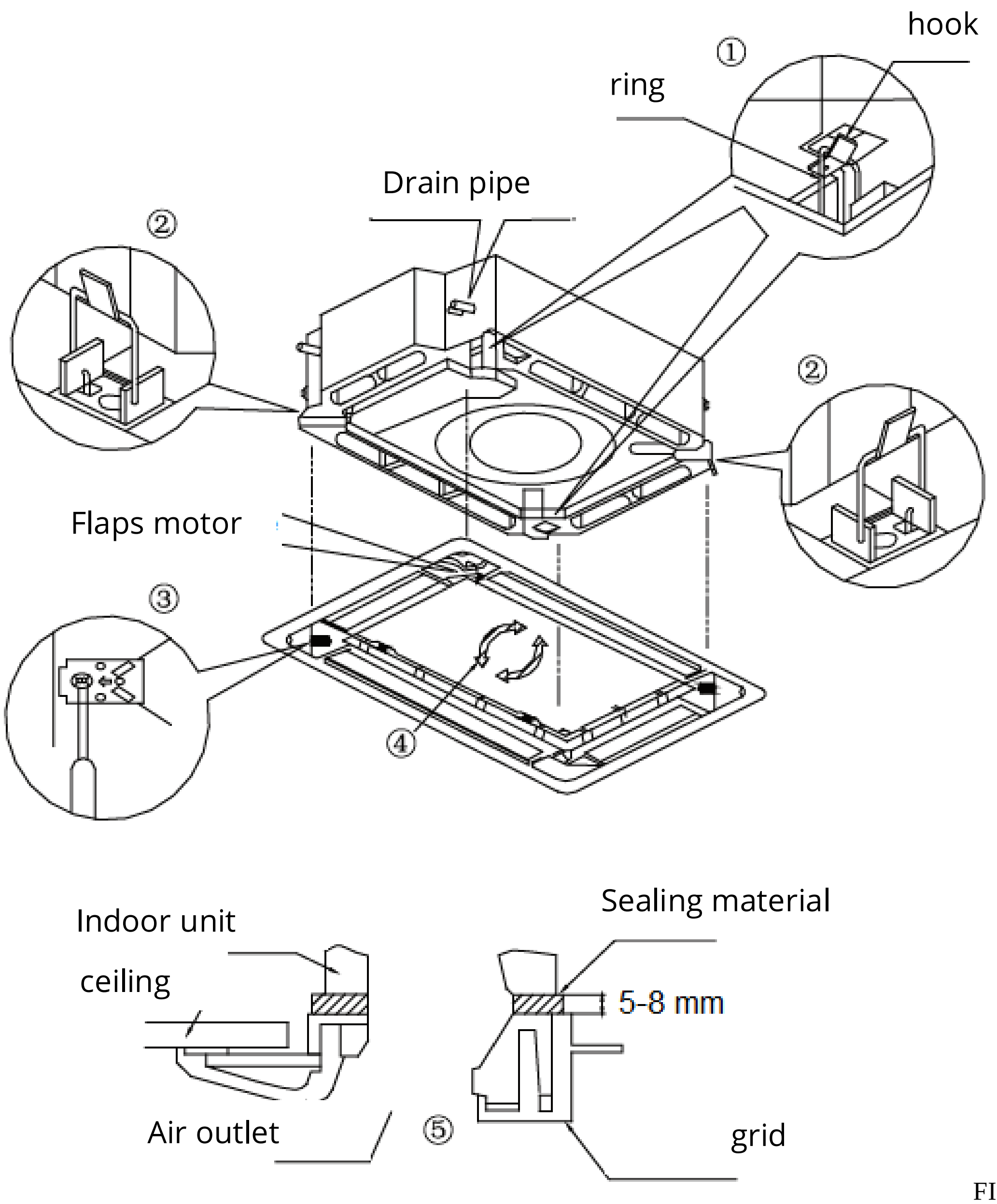

hook
①
ring
Drain pipe
②
②
Flaps motor
③
④
Sealing material
Indoor unit
ceiling
5-8 mm
Air outlet
⑤
grid

FIg. 30

PRECAUZIONE

1. Excessive tightening of the bolts couldcause damage as shown in fig. 31.

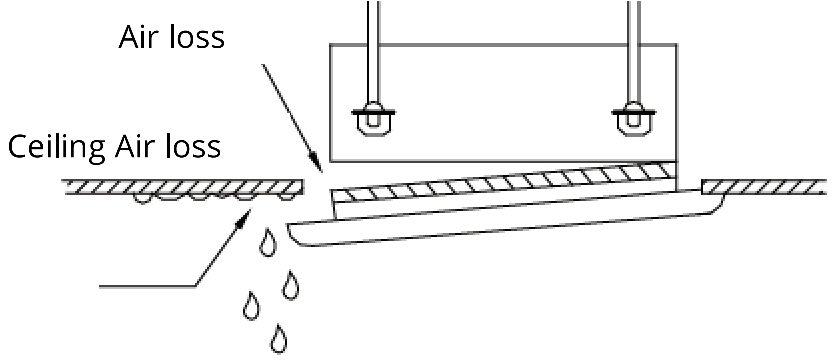


Fig. 31st

2. If the grid does not adhere snugly to the ceiling after screwing the bolts, adjust the height of the indoor unit (see fig. 32).

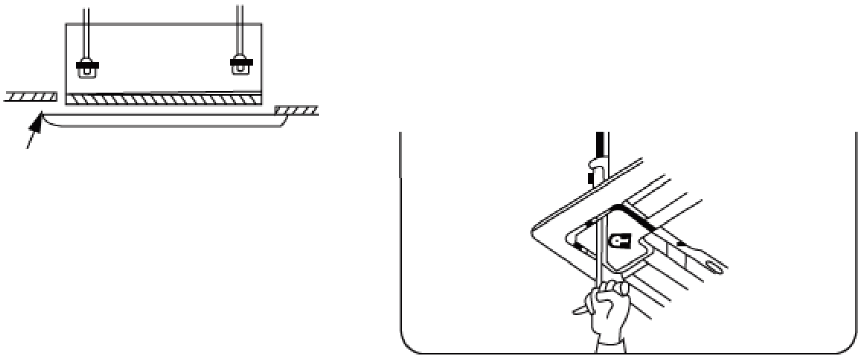


FIg. 32nd

The height adjustment of the indoor unit can be made from the openings of the grid. All this is possible if the indoor unit is kept level and the drainage pipe complies with the requirements of correct installation.

- After fixing, make sure that there is no distance between the ceiling and the grid.

3. Connection of the ceiling grid

Connect the two connectors for the motor wire fins installed in the grid (see fig. 3 3).

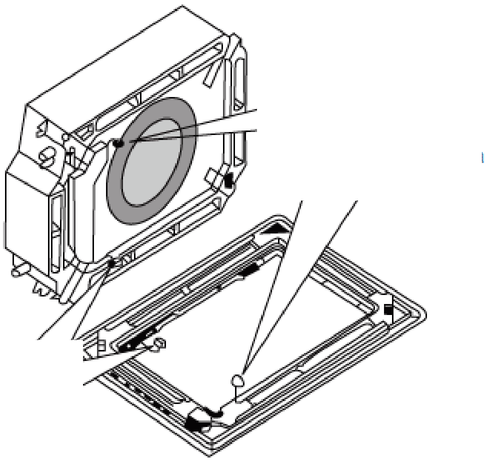
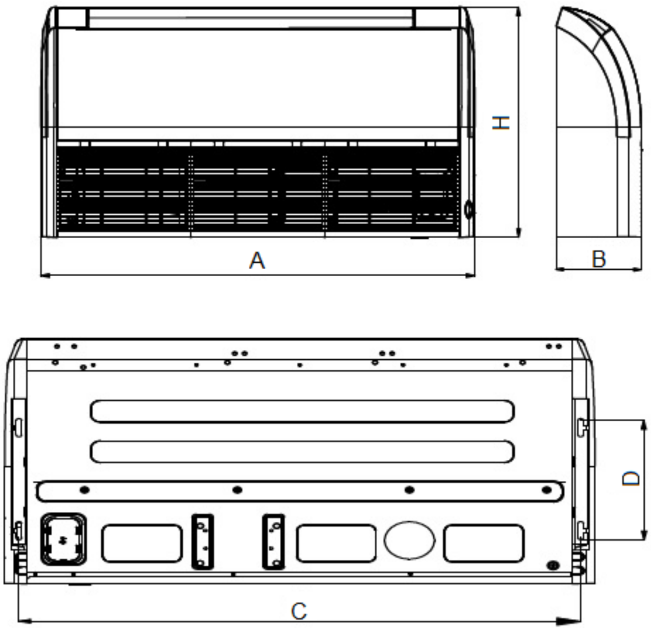


Fig. 33rd

NOTES

Pay attention to the positioning of the connections with the grid that must be duly protected against moisture and external agents.

INSTALLATION OF INDOOR FLOOR/CEILING UNIT - FSV



Model		**A**	**B**	**C**	**D**	**H**	**Liquid line**	**Gas** line
FSV1818HE32	Mm	870	235	812	280	665	1/4"	Fig. 34th
FSV2418HE32	Mm	1200	235	1142	280	665	3/8"	5/8"
FSV3618HE32	Mm	1200	235	1142	280	665	3/8"	5/8"

MINIMUM RECOMMENDED INSTALLATION DISTANCES

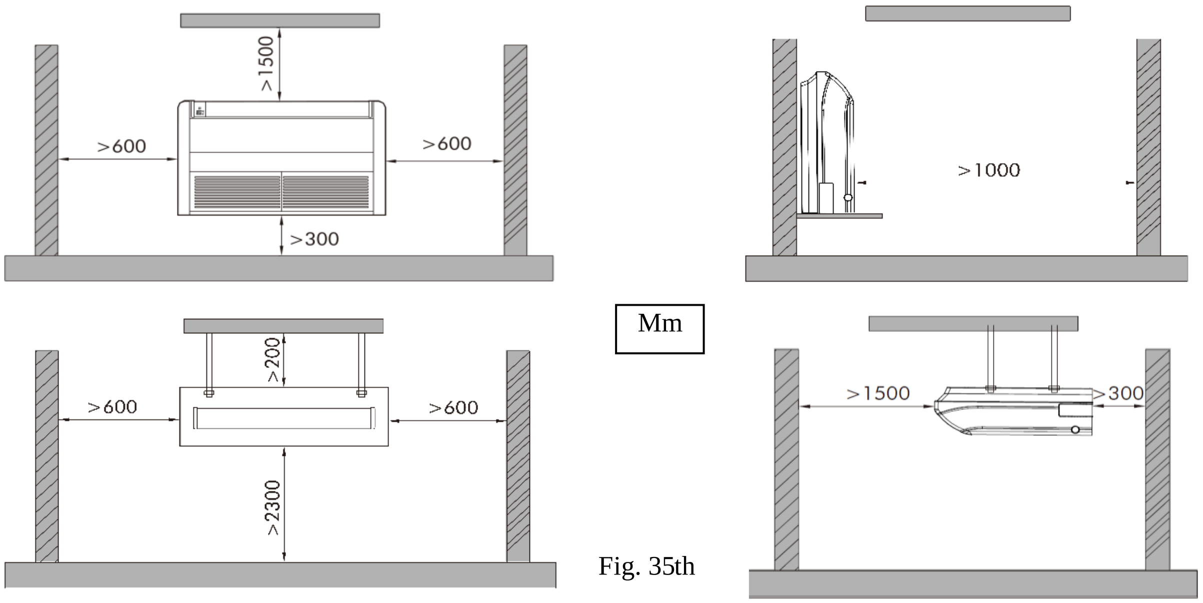

>1500
>600
>600
>300
>1000
Mm
>200
>600
>600
>2300
>1500
>300

Fig. 35th

SIDE PANEL REMOVAL

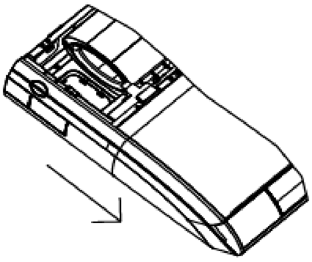


Fig. 36th

1) Toopen the intake grilles and remove them by pressing the clasp of the hinges.
2) Remove the screws that secure the two side panels then remove them in direction of the air outlet (Fig.36).

Note: The attachment system of the unit varies depending on the type of installation (fixed to the ceiling / wall or with tie rods leaving the space between ceiling and unit).

DRILLING FOR PIPE PASSAGE

Choose the most appropriate direction for the connecting pipes: three possible Different directions, as shown in F IG. 37.
The condensate drain hose for all models can be connected from the left side.
Once the position has been chosen, place the drilling template (supplied with the unit) on the ceiling or wall at the desired point for installation of the unit (fig. 38).
Use a pencil to highlight the location of the holes you want to make.

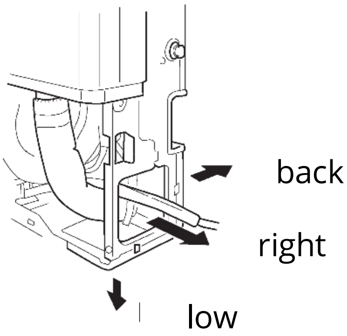


Fig. 37th

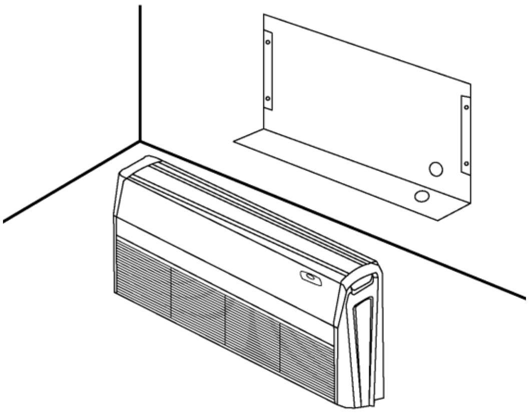


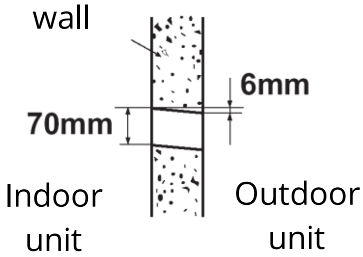
Fig. 38th

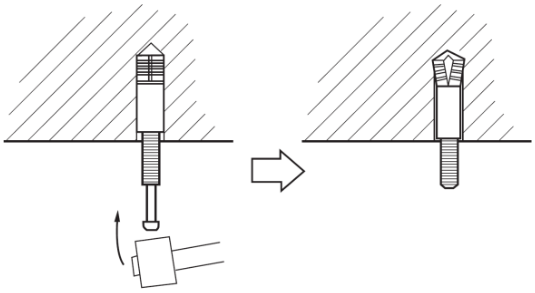
CAUTION

Since the drilling template is made of cardboard and therefore subject to elongation and restrictions as temperature and humidity vary, check the marking distances before drilling the tie rod holes.

FIXING THE INDOOR UNIT

1. After choosing the direction for the pipes, drill a hole of Ø 70 mm in the wall in such a way that the hole is slightly inclined outwards for facilitate the discharge of water (fig.39).





2. Using a drill bit suitable for the material to be drilled (concrete, wood, etc.) drill 4 holes for M10 dowels (fig. 40)
Insert the tie rod dowels directly into the insole.
Screw the tie rods so that they protrude from the suspended ceiling maximum 40 mm

3. Mount the brackets using nuts, washers and elastic washers (fig. 41).

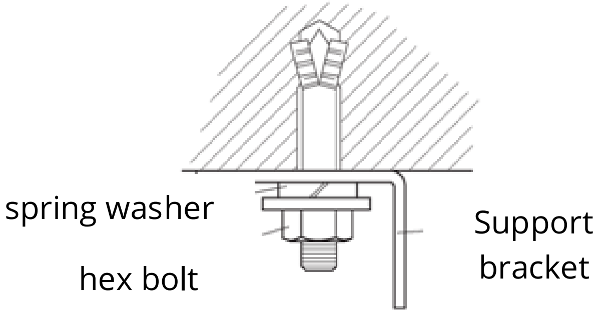
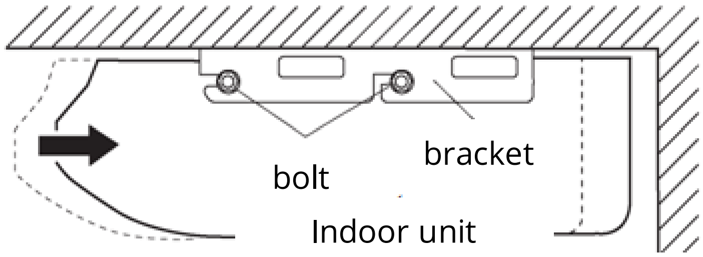


Fig. 41st



4. Lift the indoor unit and attach it to the suspension brackets (fig. 42).

5. Fix two hexagonal bolts on both sides by locking the unit in place (fig. 43)

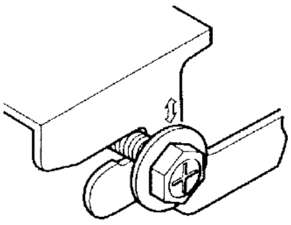
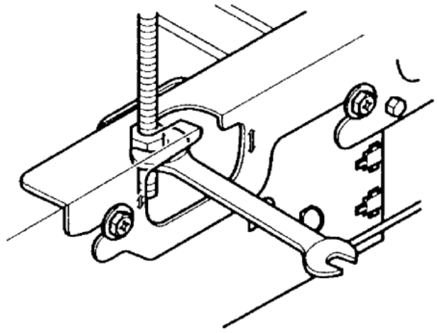


Fig. 43rd



6. Adjust the height and therefore the inclinatior Fig. 13th it so as to ensure a slight slope towards the condensate drain, for allow the correct outflow of condensate (fig. 44). Since the ceiling is often not leveled, it is advisable to leave a space of 1 cm between the unit and the ceiling and to fill (possibly) this space with insulating filling.

CONDENSATE DRAIN PIPE INSTALLATION

- Insert the condensate drain hose into the condensate collection tray; Then fix the tube using the nylon fixing band.
- Wrap the insulation around the condensate drain fitting.
- Make sure that the condensate drain pipe is tilted downwards from the exit point from the indoor unit.

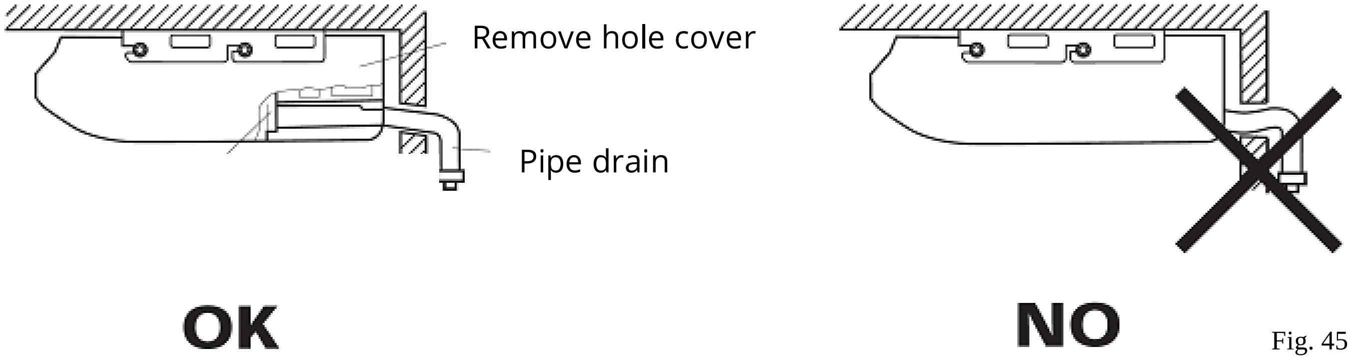

Remove hole cover
Pipe drain
OK
NO

Fig. 45

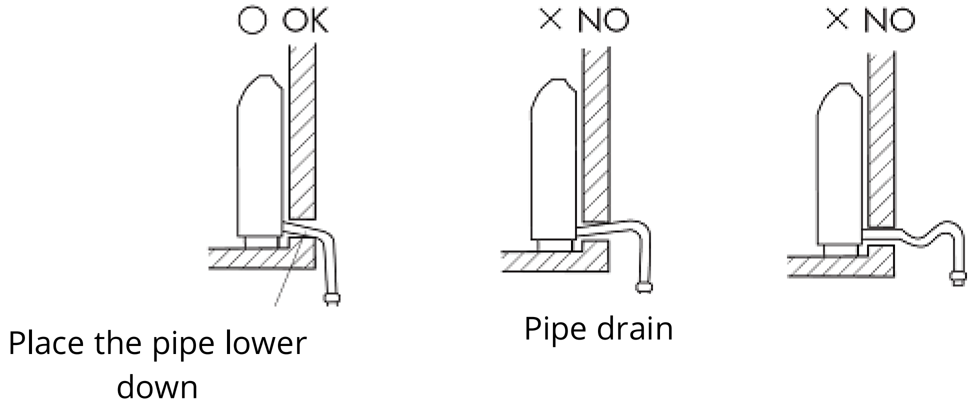

○ OK
× NO
× NO
Place the pipe lower down
Pipe drain

Fig. 46

EXTERNAL DRIVE INSTALLATION

AVOID:

- Areas affected by hot air inputs (chimneys, air extractors, etc.).
- Wetlands, with risk of flooding or with irregular bottom.

PREFERRED:

- Choose areas possibly in the shade and cool.
- Choose ventilated areas where the temperature does not exceed 48 ° C for long periods.
- Leave sufficient space around the unit for inlet airflow, delivery and maintenance
- Place on a solid, raised base relative to the surrounding ground by about 15 cm to reduce moisture and water stagnation inside the unit.
- Attach the unit to the support base to reduce vibration and noise.

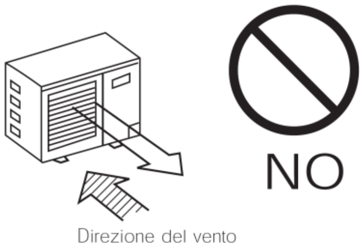
WINDY AREAS AND/OR AREAS WITH A LOT OF SNOW

In places exposed to strong winds, it is necessary to install a snow-tight pipeline and also to avoid direct exposure to the wind as much as possible. In the case of areas with snow and strong winds.

In the case of areas with snow and strong winds, appropriate countermeasures must be taken to avoid problems if the outdoor unit is not equipped with a snow-tight platform and pipeline. In fact:

a) The external fan may not spin damaging the drive.
b) Airflow may be missing.
c) Pipes may freeze and burst.
d) Condenser pressure may drop due to strong wind and ice may form in the indoor unit.

In snow-prone areas, the outdoor unit must be equipped with a snow-tight platform and pipeline.



INSTALLATION

- The mounting base must be made of concrete or similar material to allow adequate drainage.
- Ordinarily, make sure that the base has a height of 5 cm or higher. If a drain pipe is used, or for installation in regions with a harsh climate, ensure a base height of 15 cm or more at the pins on both sides of the unit. (In this case, leave an empty space under the unit for the eventual installation of the drain pipe, and to prevent the freezing of waste water in regions with harsh climate).
- Be sure to secure the feet with anchor bolts (M10). Also, use special washers on the upper side. It is recommended to resort to large square washers, not supplied.

DIMENSIONS

MSV 1218 - 1818 - 2418 HE32

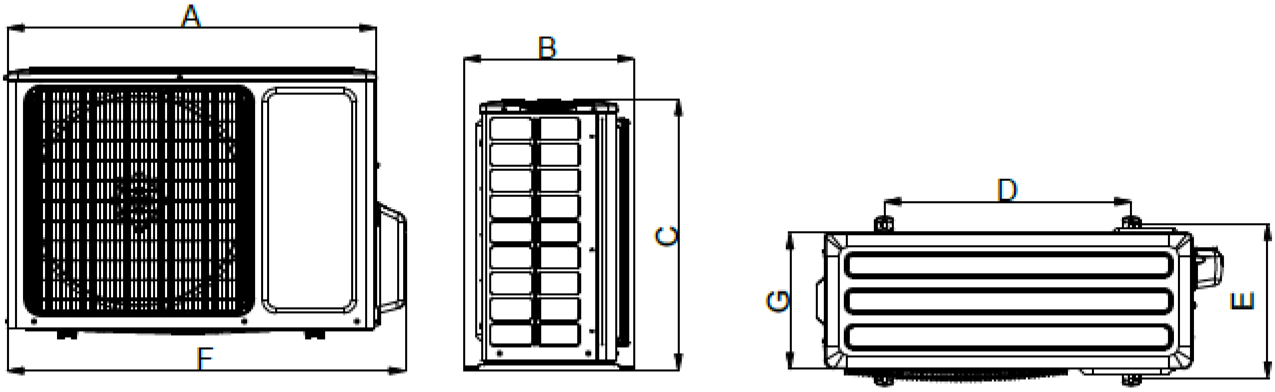


Fig. 47

MSV 36 18 - 48 18HE32

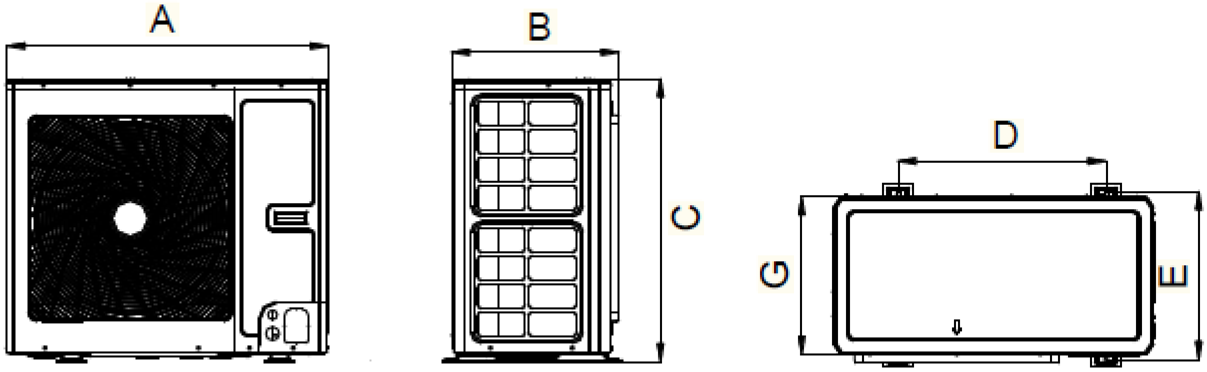


Fig. 48

MSV 6018 HE32

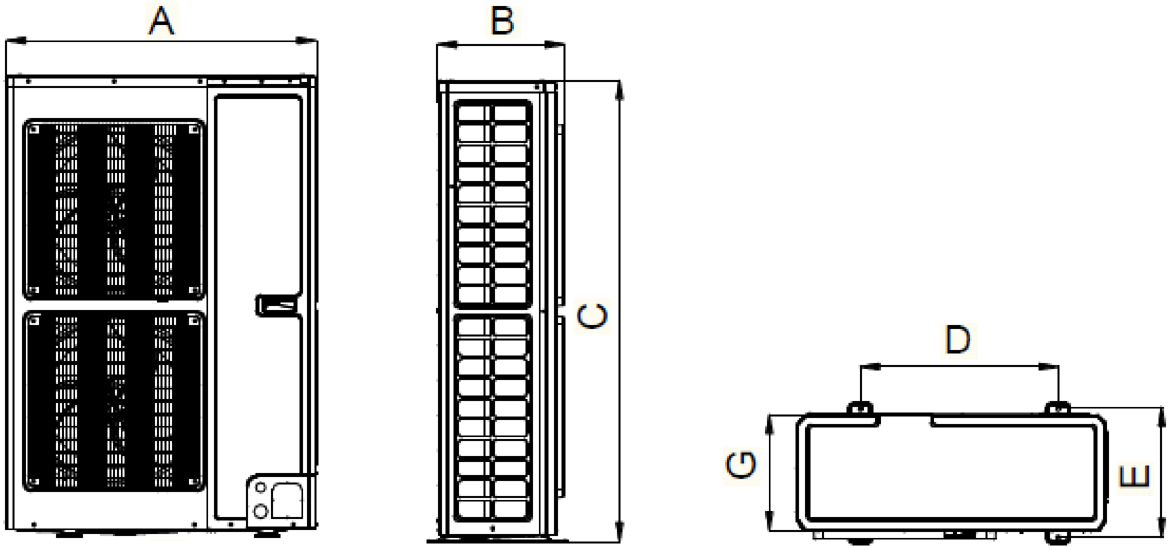


Fig. 49

Model		A	B	C	D	And	F	G
MSV1218HE32	Mm	818	378	596	550	348	887	302
MSV1818HE32	Mm	818	378	596	550	348	887	302
MSV2418HE32	Mm	892	396	698	560	364	952	340
MSV3618HE32	Mm	940	530	820	610	486	/	460
MSV4818HE32	Mm	940	530	820	610	486	/	460
MSV6018HE32	Mm	900	412	1345	572	378	/	340

MINIMUM INSTALLATION DISTANCES

The distance between the obstacles, the air intake of the unit and the exhaust outlet shall be as shown in the following table.

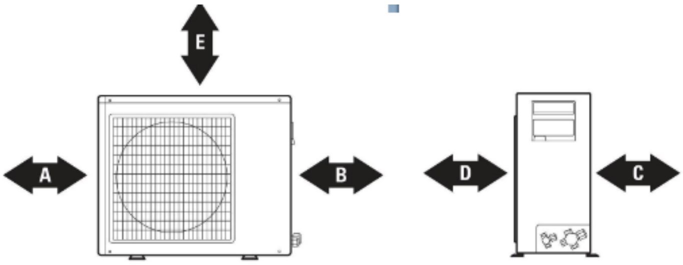


Fig. 50

Model		A	B	C	D	And
MSV1218HE32	Mm	350	300	300	2000	1000
MSV1818-2418HE32	Mm	350	500	300	2000	1000
MSV3618HE32	Mm	600	500	300	2000	1000
MSV4818HE32	Mm	600	500	300	2000	1000
MSV6018HE32	Mm	600	500	300	2000	1000

- If external units areinstalled one on top of the other, provide a minimum distance of 400 mm (length) and 500 mm (height) between one unit and another (Fig.51).
- If external drive files are installed, allow a minimum space as indicated in Fig.52.

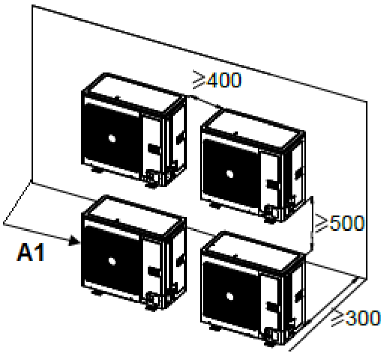


Fig. 51st

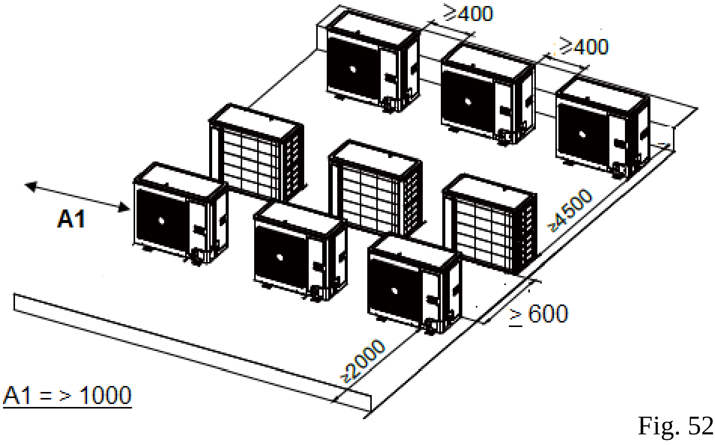


Fig. 52nd

DRAINAGE OF DEFROST WATER

- Ensure a base height of 15 cm or more at the pins on both sides of the unit.
- If a drain pipe is used, install the drain socket on the appropriate drain opening holes on the unit crankcase. Seal the other drain opening with the rubber stopper (fig. 53).
- In the event that the installation site reaches cold winter temperatures, provide heating cables on the machine crankcase near the battery and the discharge.

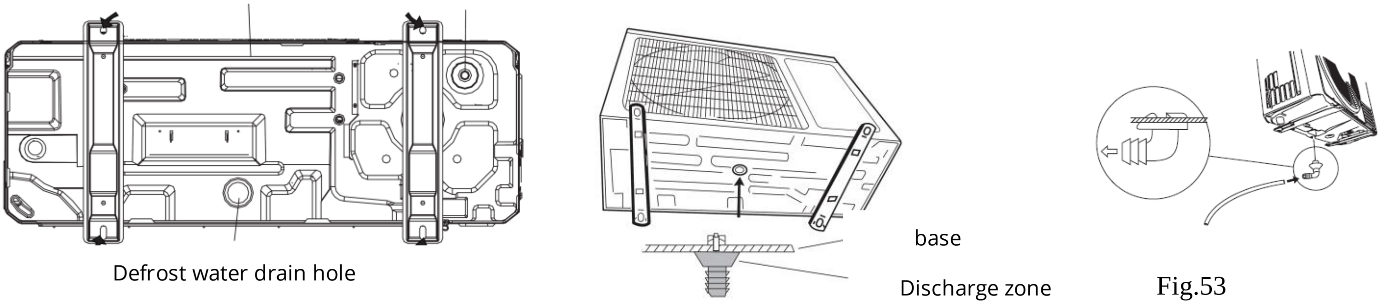


Fig.53

COOLING

The refrigerant used in the air conditioners mentioned in this manual is type R32, an odorless, fluorinated greenhouse gas covered by the Kyoto Protocol, with a zero ozone depletion potential and a global warming potential of 675.
The refrigerant R32 falls into class 2L with "low flammability", therefore the air conditioner must not be installed / used in rooms with the presence of heat, gas, smoke and stoves.
R-32 does not ignite if the concentration level in a room is below the flammability limit (0.306 kg/m³).
International and European safety norms and standards, such as EN 60335-2-40 and EN 378, define the requirements to be met in order to remain below the lower flammability limit in the event of dental leakage.
In addition, the R-32 does not turn on easily. Sparks produced by relays or switches in household appliances and common static electricity do not have enough energy to turn on R-32.

WARNINGS

- **Installation** and **maintenance operations must be carried out, in compliance with current regulations, only by qualified personnel in possession of a refrigeration license in order to operate correctly and safely with flammable refrigerants.**
- The refrigerant circuit can only be repaired according to the methods suggested by the manufacturer of the air conditioner.
- Do not use means to speed up the thawing process or to clean the equipment other than those recommended by the manufacturer.
- Do not drill holes in the circuit, and do not burn the connecting pipe.
- Joints made in the system between parts of the refrigerant system must be easily accessible for maintenance.
- Do not reuse joints already used once.
- The leak test is mandatory after installation.
- **The air conditioner must be stored and installed in a well-ventilated environment without continuously operating ignition sources (eg a gas appliance in operation, an electric heater in operation, open flames, etc ...).**

- Pipes should be as short as possible, protected to prevent physical damage and should not be installed in unventilated spaces.
- The air conditioner must be installed in an environment with a minimum surface area indicated in the table below.
  Note: To determine the minimum surface area consider the total charge of the system, then the sum of factory pre-charge and amount of refrigerant added on site.
- If the external unit is installed indoors (garages, technical rooms, etc.), for the determination of the minimum surface area refer to the values indicated for floor units (if the outdoor unit is placed on the floor) or wall units (if the outdoor unit is installed at least 1.8 meters above the ground).

	MINIMUM AREA OF A ROOM FOR INSTALLATION INSIDE - m²													
Amount of charge (kg)	≤ 1.2	1,3	1,4	1,5	1,6	1,8	1,9	2	2,1	2,2	2,3	2,4	2,5	2,7	3,60
Floor mounting	/	14,5	16,8	19,3	22	27,8	31	34,3	37,8	41,5	45,4	49,4	53,6	62,6	111
Wall mounting	/	1,6	1,9	2,1	2,4	3,1	3,4	3,8	4,2	4,6	5	5,5	6	7	12,4
Ceiling mounting	/	1,1	1,3	1,4	1,6	2,1	2,3	2,6	2,8	3,1	3,4	3,7	4	4,65	8,30

Maintenance and transport notes

- Check whether the maintenance area or the surface of the room corresponds to the requirements indicated in the previous table, since only with the correct requirements is maintenance allowed.
- Check if the maintenance area is well ventilated. The state of continuous ventilation should be maintained during the process of operation.
- Check if there is a heat source or potential heat source in the maintenance area. The flames Free are prohibited in the maintenance area andthe sign "no smoking" must be hung.
- Check if the warning mark is in good condition, otherwise replace it.
- Use the flammable gas detector to check before discharge and before opening the container.

Welding

- If necessary to cut or weld the pipes of the refrigeration system in the maintenance process , proceed as follows:

a) Turn off the unit and disconnect the power supply
b) Remove the refrigerant
(c) Aspirarand
(d)Clean the circuit with nitrogen
e) Cutting and welding
f) Clean the circuit again with nitrogen

- The refrigerant should be recycled in the specialized storage tank.
- Make sure that there is no open flame near the pump outlet and that the space is well ventilated.

CONNECTION OF REFRIGERATION PIPES

LIMITS ON LENGTH AND HEIGHT DIFFERENCE OF REFRIGERANT PIPES

The length of the refrigerant pipes between the indoor and outdoor unit must be as short as possible and is also limited by compliance with the values of maximum difference in height between the units.
By installing refrigerant pipes minimize both length (L) and height difference (H).

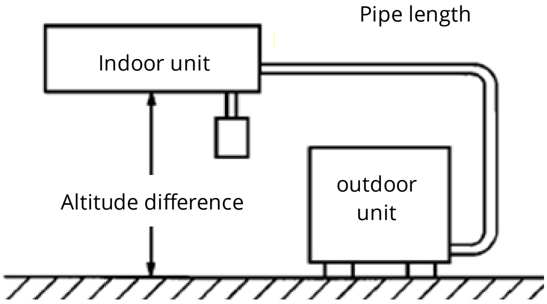


Fig. 54

REFRIGERANT QUANTITY

The table below shows splitting and charging data for a standard length of 5 meters (7.5 meters for MSV4818 and MSV6018 models).

External drive model		MSV1218	MSV1818	MSV2418
Type of refrigerant		R32	R32	R32
Standard refrigerant charge (on shipment)	Kg	0,78	1,00	1,60
Diameter of the liquid tube	mm (inch")	6,35 (1/4")	6,35 (1/4")	9,52 (3/8")
Gas pipe diameter	mm (inch")	9,52 (3/8")	12,7 (1/2")	15,8 (5/8")
Max pipe length (with standard load)	m	7	7	7
Max pipe length (with additional load)	m	30	35	50
Additional charge of coolant	gr/m	16	16	25
Maximum height difference (outdoor unit above)	m	15	20	25
Maximum height difference (indoor unit above)	m	15	20	25

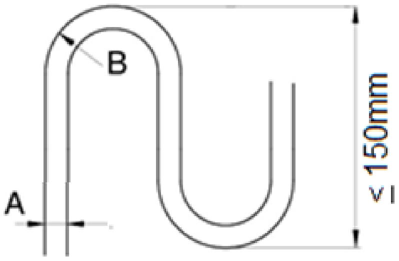
External drive model		MSV3618	MSV4818	MSV6018
Type of refrigerant		R32	R32	R32
Standard refrigerant charge (on shipment)	Kg	2,5	2,80	3,60
Diameter of the liquid tube	mm (inch")	9,52 (3/8")	9,52 (3/8")	9,52 (3/8")
Gas pipe diameter	mm (inch")	15,8 (5/8")	15,8 (5/8")	15,8 (5/8")
Max pipe length (with standard load)	m	7	9,5	9,5
Max pipe length (with additional load)	m	65	75	75
Additional charge of coolant	gr/m	35	40	40
Maximum height difference (outdoor unit above)	m	30	30	30
Maximum height difference (indoor unit above)	m	30	30	30

No need for additional charge of compressor oil.

PRECAUZIONE

In case of installation with a difference in height of 10 meters or more, it is necessary to create a siphon (oil trap) every 6 meters in altitude.
Attention: the siphon must be performed on both gas and liquid pipes.

A	B (mm)
9,52 (3/8")	≥20
12,7 (1/2")	≥26
15,8 (5/8")	≥33

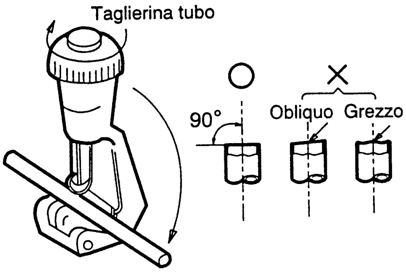


NOTES

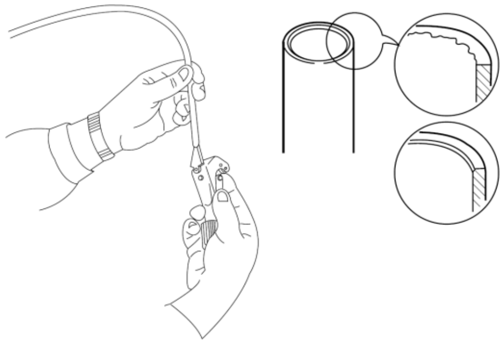
- Copper pipes compliant with UNI EN 12735-1 (see Eca Technology products) deoxidized in rolls, sealed and protected with inert gas suitable for refrigeration systems. The pipe wall must be at least 0.8mm thick and must be able to withstand a pressure of 6.0 MPa.
- Closed-cell polyethylene foam insulation of length equal to the pipes and of high thickness.
- Depending on the type of system, pipes for liquids or gases can be both small and large. To avoid confusion, speaking of refrigerant pipe, it will be specified: small pipe for liquid, large for gas.
- Ventilate the area if refrigerant leaks occur during installation. Prevent any refrigerant leaks from coming into contact with hot parts or open flames and releasing toxic gases.
- Use the pipe folder link method.

COUNTERSINK PROCEDURE WITH A COUNTERSINK

1. Cut the copper pipe to the required length with a pipe cutter. It is advisable to make the cut leaving about 30 – 50 cm of length additional to the estimated distance (fig.55).



f ig.55



2. Remove burrs at the end of the copper pipe with a burring machine. This part of the procedure is important and should be done carefully to ensure that countersinking succeeds correctly. Avoid the possible entry of contaminants (moisture, dirt, metal residues, etc.) (fig.56)

When deburring, keep the hose facing down and make sure that No copper slime falls into it.

Fig. 24th

3. Remove the filler from the unit and be sure to mount it on the copper tube in the correct direction.

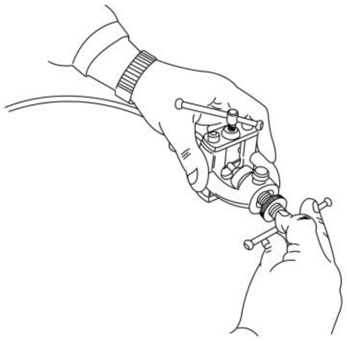


Fig.57

4. Create a countersink at the end of the copper tube with a folder holder Ridgid type or equivalent (fig.57).
5. Proper flaring must have the following characteristics:
   - the inner surface is glossy and smooth;
   - the edge is smooth the tapered sides are of uniform length.

PRECAUTION BEFORE CONNECTING PIPES

1) **During transport and storage, always keep the tubes sealed with a cap or adhesive tape before use to prevent water, dust and dirt from entering.**
2) Always lubricate the surfaces of the flange and the joining nipples with antifreeze oil before connecting. This facilitates the good seal of the joint (fig.58).
3) Keep the flanged pipe, the nipples of the joint and the union well aligned, then tighten the union by hand until a good contact is made between the flange of the pipe and nipples.

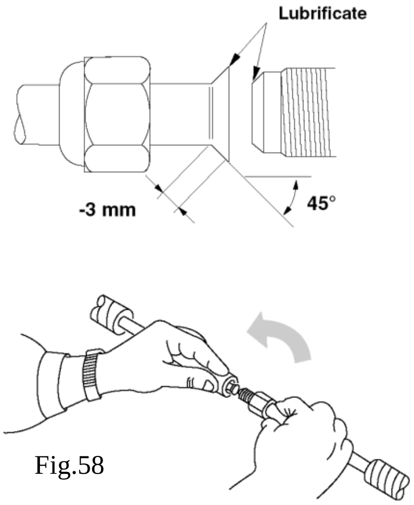


Fig.58

PIPE CONNECTION BETWEEN INDOOR AND OUTDOOR UNITS

1) Connect the pipes to the attachments of the indoor unit and extend them through the wall to the outdoor unit. Use a fixed wrench and a torque wrench for clamping (fig.59).
2) Apply the tightening torques indicated in the table

Pipe diameter	Torque
6.35 mm – 1/4"	15 - 30 Nm
9,52 mm – 3/8"	35 - 40 Nm
12.7 mm – 1/2"	45 - 50 Nm
15,88 mm – 5/8"	60 - 65 Nm
19.05 mm – 3/4"	70 - 75 Nm

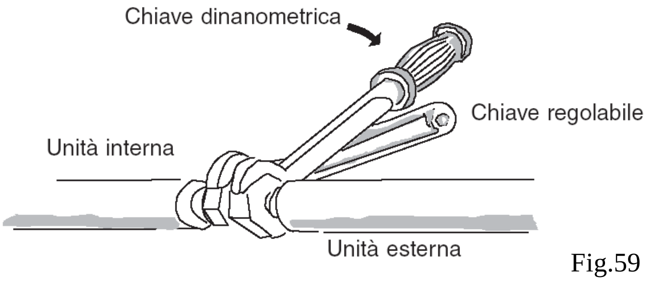


Fig.59

- When removing or tightening the fillers, use 2 wrenches simultaneously: one on the pipe union and the other on the unit tap.
- For pipe connections, be sure to use the fillers supplied with the unit, or pipe fillers for R32.

REFRIGERANT PIPE INSULATION

- Thermal insulation must be applied to the pipes of the entire unit, including the distribution fitting (purchased separately).
- For gas pipes, the insulation material must be heat-resistant at temperatures of 120°C or higher. For other pipes, it must be heat-resistant to temperatures of 80°C or higher.
- The thickness of the insulating material must be suitable to ensure minimum heat loss and to avoid condensation and dripping.

INSULATION OF THE FILLERS

- Wrap the fillers with insulating tap covers (Drain Stop Eca Technology) or with white tape, then cover with insulation and seal with black tape. Finally, fix the insulation at both ends with plastic hose clamps (after checking the system leak test).

TUBE TAMINATION

- Coolant pipes (and electrical wiring if permitted by local regulations) should be taped together using reinforced adhesive tape. The drainage pipe must be left separate.
- Wrap the tape from the external drive. to get to the top where the pipe enters the wall. Overlap the tape for about half of its width.
- Attach the pipes to the wall with brackets arranged at intervals of 1 meter.

CAUTION

Do not bend the copper tube with a narrow radius of curvature after the tube has been insulated; The tube may bend and break.

PIPE AND VACUUM LEAK TEST

Verify that all connections are not leaking.
The presence of air and humidity inside the refrigeration system can have the following side effects:

- Increased system pressure
- Increase in operating current
- Reduced cooling (or heating) efficiency
- Possible freezing of moisture in the refrigerant circuit, resulting in blockage of the pipes
- Possibility of corrosion caused by water of parts of the refrigeration system

Therefore, the indoor unit and the piping between the indoor and outdoor units must be leak-tested and emptied to remove any trace of non-condensing elements and moisture from the system.

LEAK TEST

After completing the connection of the refrigerant pipes, perform the watertightness test. In the test, pressure the pipes using a nitrogen cylinder as shown in the figure.

- Close the liquid and gas valves completely. Nitrogen could enter the cooling circuit of the outdoor unit, therefore, before pressurizing the pipes, close the taps on the gas and liquid side well.
- For each of the refrigeration circuits, pressurize the pipes by acting from the gas exhaust valve (see figure).

1) Pressurize for 3 minutes at 0.3MPa (3.0 bar).
2) Pressurize for 3 minutes at 1.5MPa (15.0 bar). A big leak will be found.
3) Pressurize for approximately 24 hours at 3.0MPa (30.0 bar). A small leak will be found.

If the pressure does not drop, the system is in place. If the pressure drops, the leak must be identified.

- While pressurizing for 24 hours, any 1°C change in ambient temperature will result in a pressure change of 0.01MPa (0.1 kg/cm2g). This must be taken into account when performing the test.
- In steps 1) to 3), if the pressure drops, check each joint with touch, hearing, and soapy solution to detect the leak. Then rerun the joint or tighten the nut well.

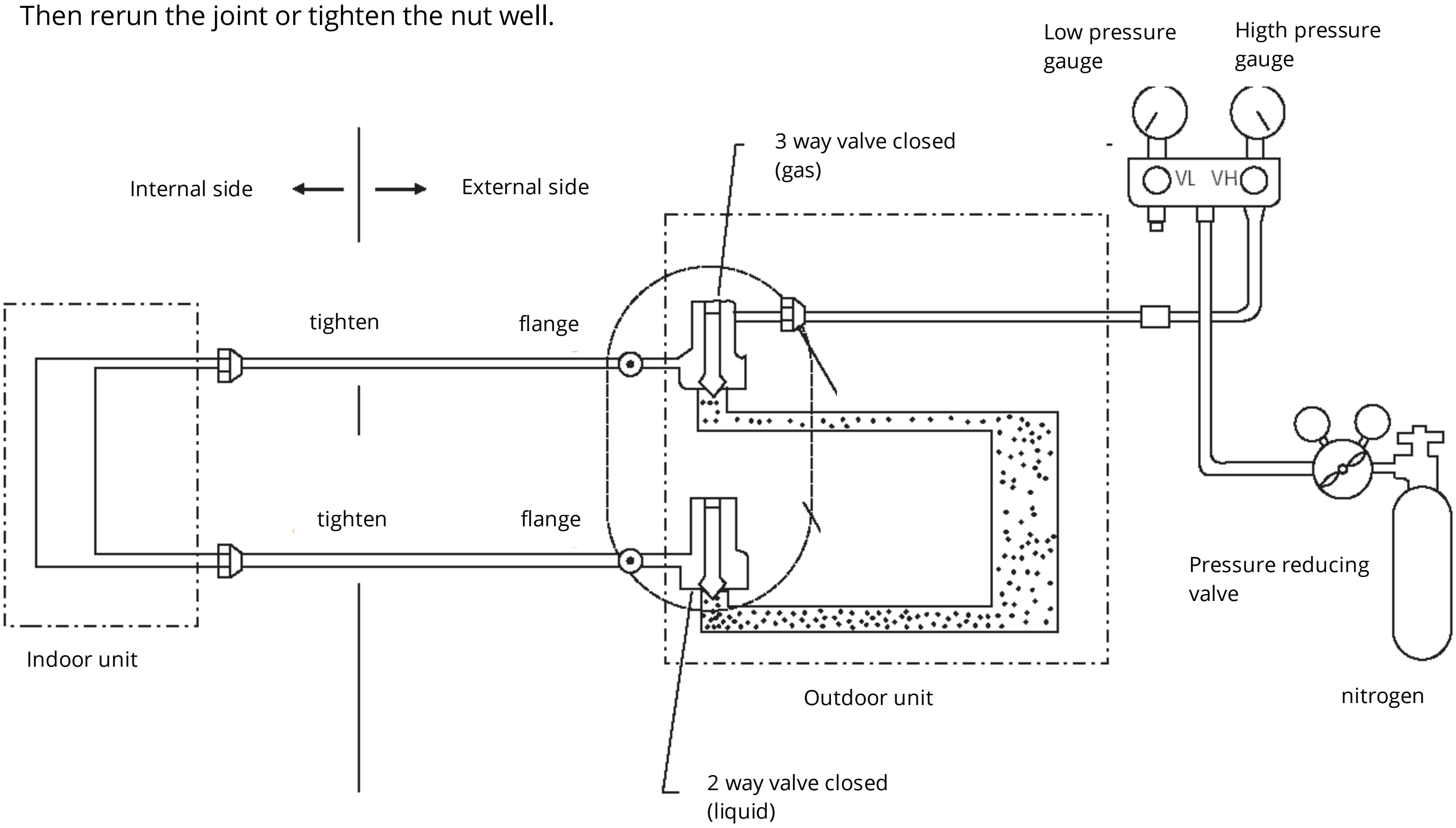

Low pressure gauge
Higth pressure gauge
3 way valve closed (gas)
Internal side
External side
VL
VH
tighten
flange
tighten
flange
Pressure reducing valve
Indoor unit
Outdoor unit
nitrogen
2 way valve closed (liquid)

Fig. 60th

VACUUM EXECUTION

- Using a pump to perform vacuum, it is strictly forbidden to purge the coolant.
- Choice of vacuum pump: choose a pump that reaches a high vacuum value (less than -755mmHg) and has a high air discharge capacity (greater than 40 liters/min).
- After completing the leak test and discharging the nitrogen, connect the diverter tool to the gas exhaust valve (3 ways), then connect the vacuum pump as shown in the figure.
- Vacuum for 1-2 hours depending on the length of the pipelines. Before operation, make sure that the liquid and gas valves are completely closed.
- If after 2 hours the pressure does not reach values below -755 mmHg, continue to perform vacuum for another hour. If after a total of 3 hours the pressure has not yet dropped below -755 mmHg, the leak must be identified and repaired.
- If after 2 hours the pressure drops below -755 mmHg, close both VL and VH valves of the diverter, then close the pump and observe if after 1 hour the vacuum level changes. If it changes, it means that there is a leak in the system, and therefore the leak must be identified.
- After completing the vacuum execution, replace the vacuum pump with the refrigerant container and proceed to load the coolant (if necessary)
- **Perform the procedure described above for each individual circuit where the service fitting is present.**

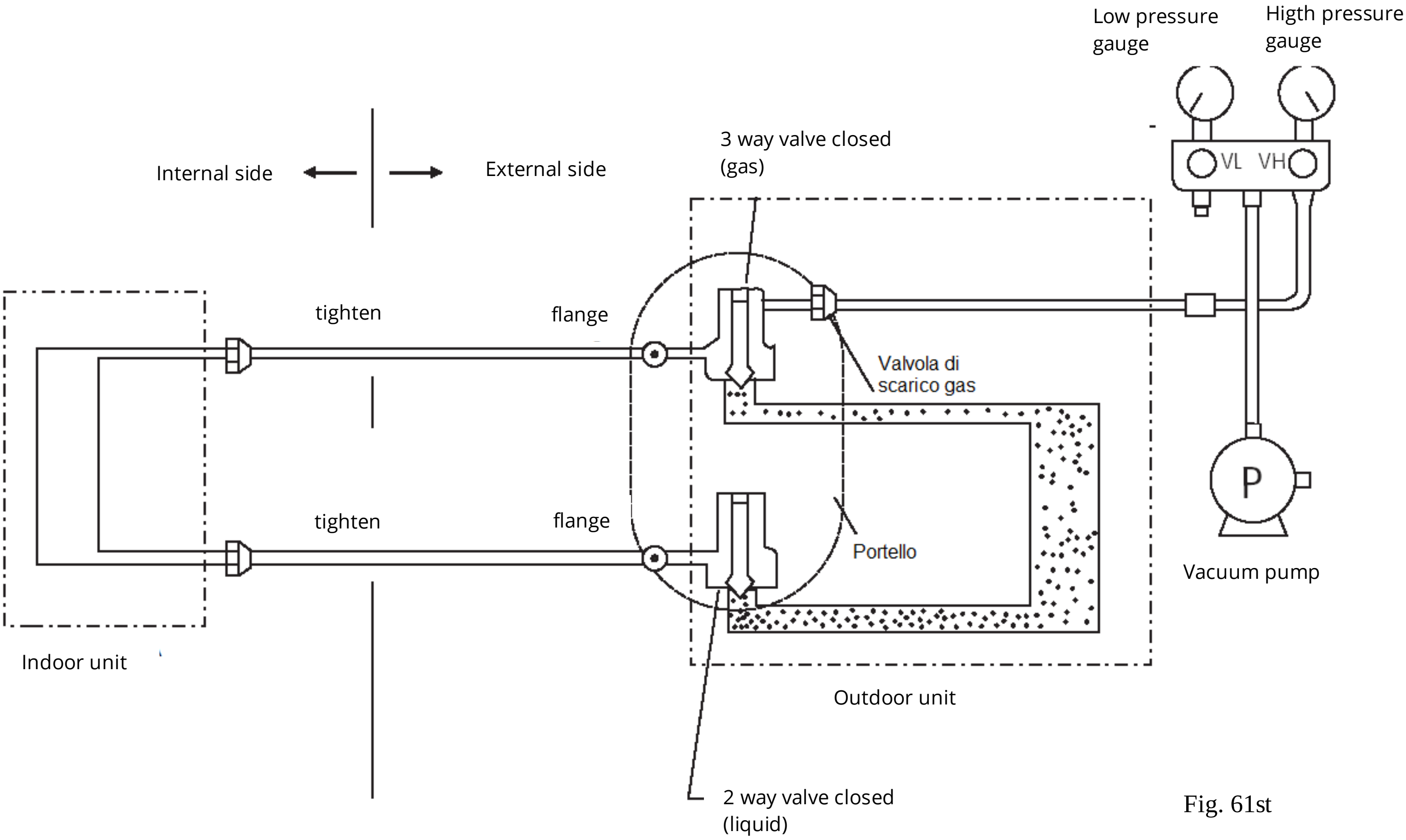

Low pressure gauge
Higth pressure gauge
VL
VH
3 way valve closed (gas)
Internal side
External side
tighten
flange
Valvola di scarico gas
P
tighten
flange
Portello
Vacuum pump
Indoor unit
Outdoor unit
2 way valve closed (liquid)

Fig. 61st

ADDITIONAL CHARGE OF REFRIGERANT

- If the total length (L) of the connecting pipes between the unit is lower than that shown in the table on page 45 It is not necessary to make an additional charge of refrigerant.
- If the connecting pipes have a longer length (L), an additional charge must be made per meter (M)
  as indicated in the same table.
- Charge the additional coolant (calculated based on the distance between indoor and outdoor units) using the large pipe service valve.
- Use a scale to measure refrigerant accurately.
- Add coolant only in Cooling mode.
- Be careful not to let air into the system, and to charge the refrigerant only in a liquid state.
- If an additional charge of refrigerant is performed, indicate the length of the refrigerant pipeline and the amount of the additional charge of refrigerant on the product nameplate.

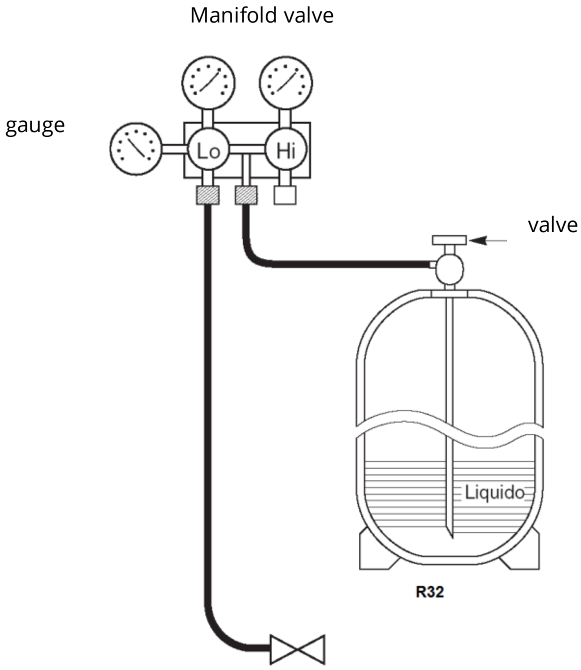


Fig. 62nd

ELECTRICAL CONNECTIONS

GENERAL PRECAUTIONS

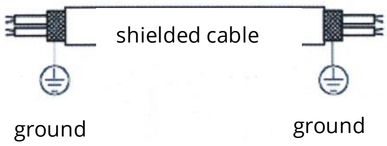
1) Electrical connections must be made by a specialist electrician and must comply with local electrical regulations.
2) Before any intervention, remove the power supply to the air conditioner andmake sure that the supply voltage of the installation site is equal to that indicated on the plate of the unit.
3) Check that the characteristics of the electrical network are adequate to the absorptions indicated on the data plate of the unit, also considering any other devices operating at the same time.
4) Provide a separate power outlet for each air conditioner.
5) To protect the unit against short circuits, mount an omnipolar magnetothermic switch on the supply line with a minimum contact distance of at least 3mm on all poles. Periodically check the installed safety devices.
6) Each electrical connection must be carried out in accordance with the following wiring schemes. An incorrect connection can cause the unit to malfunction or be damaged.
7) The unit should only be powered after all connections have been completed.
8) Cable diameter regulations vary by location. For the electrical connection rules in place, please refer to the **LOCAL ELECTRICAL REGULATIONS** before you begin. Make sure that the installation is carried out in accordance with all applicable laws and regulations.
9) **It is mandatory to perform the grounding** (yellow-green wire usable only for grounding) according to local electrical regulations. Check that the appliance is always connected to the ground correctly, otherwise electric shock may occur. ECA Technology does not accept any liability in the house for failure or improper grounding.
10) If any power cords inside the unit are damaged, they must be replaced by personnel from an authorized service center. Special equipment is required for repair.
11) Unauthorized changes to internal electrical connections can be very dangerous. The manufacturer accepts no responsibility for any damage suffered as a result of such unauthorized modifications.
12) Prevent electrical cables from coming into contact with water pipes, refrigerant pipes, drain pipes, compressor, etc.
13) All cables related to serial connections must be kept separate from the power cables in order to avoid electromagnetic interference.
14) Never use cables with a section smaller than indicated.

External drive model	Power supply	Protection	(1) Power cord	(2) Connection cable for outdoor and indoor unit	(3) Line of control	(4) Remote control line
MSV1218HE32	230V/1F/50Hz	16 To	1.5 mm^2	1.5 mm^2	0.75 mm^2	0.75 mm^2
MSV1818HE32	230V/1F/50Hz	16 To	2.5 mm^2	1.5 mm^2	0.75 mm^2	0.75 mm^2
MSV2418HE32	230V/1F/50Hz	20 A	4 mm^2	2.5 mm^2	0.75 mm^2	0.75 mm^2
MSV3618HE32	400V/3F/50Hz	16 To	4 mm^2	1.5 mm^2	0.75 mm^2	0.75 mm^2
MSV4818HE32	400V/3F/50Hz	20 A	6 mm^2	1.5 mm^2	0.75 mm^2	0.75 mm^2
MSV6018HE32	400V/3F/50Hz	20 A	6 mm^2	1.5 mm^2	0.75 mm^2	0.75 mm^2

Select the size of the electrical wires and the protection circuit according to the following table: total length of wires: 15m; Voltage drop: less than 2%.

CAUTION

In case of electromagnetic interference, use shielded cables for the communication control cables between indoor and outdoor units and equip the shield with grounding on both sides. Failure to do so may result in operating errors caused by disturbances.



Power cord (1):
Multicore electric cable, whose recommended section and length are indicated in the electrical data table on p. 51. Make sure that the length of the conductors between the cable attachment point and the terminals is such that the active conductors stretch before the grounding conductor.

Power cord (2):
Multicore electric cable, whose recommended section and length are indicated in the electrical data table on p. 51. Make sure that the length of the conductors between the cable attachment point and the terminals is such that the active conductors stretch before the grounding conductor.

Connection cable (3) (with ground conductor) shielded:
Multicore electric cable, whose recommended section and length are indicated in the electrical data table on p. 51. Make sure that the length of the conductors between the cable attachment point and the terminals is such that the active conductors stretch before the grounding conductor.

Connection cable (4) (without ground conductor):
Multicore electric cable, whose recommended section and length are indicated in the electrical data table on p. 51.
Maximum length of communication line between indoor unit and remote control: 30 meters.

HOW TO CONNECT CABLES TO THE TERMINAL

1) Cut the end of the cable, then remove the insulation and expose approx. 10 mm of the braided cable, then twist as tight as possible Possible cable ends (fig. 63).
2) Using a star screwdriver, remove the screws from the terminal block.
3) Using pliers or a special tool, securely secure each end of the cable exposed with a ring lug.
4) Place the lug in place: reposition and tighten the terminal screw with a screwdriver (fig. 64).

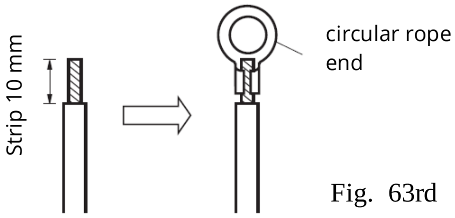


Fig. 63rd

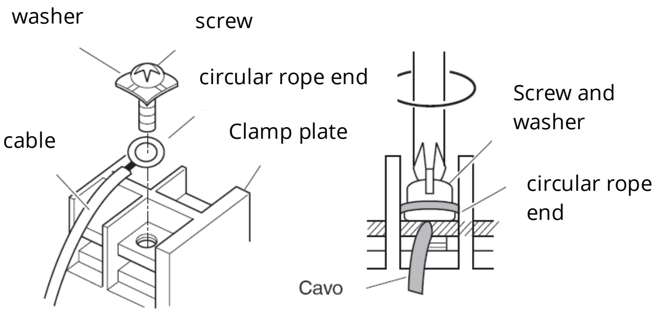


fIg. 64th

- When connecting the cables of the indoor and outdoor unit, check the numbers on the terminal blocks and the colors of the various conductors. An incorrect connection could damage electrical components.
- Securely connect the cables to the terminal block. Incorrect installation could lead to fires.
- Always fix the insulating sheath of the connection and power cables perfectly using the appropriate clamp. (If the insulating sheath is damaged, current leakage may occur.)
- **Always make the grounding connection.**

WIRING DIAGRAMS

- Connect the wires according to the sequence indicated in the figures below (1-2-3-4). An incorrect connection can cause damage to the unit.
- **Remote control is optional for indoor cassette (CSV) and floor/ceiling (FSV) units.**
- In units with three-phase power supply, check that the sequence of phases is L1-L2-L3, otherwise when starting the compressor may turn upside down and operate improperly.

ELECTRICAL CONNECTIONS BETWEEN INDOOR AND OUTDOOR UNITS

Models SINGLE PHASE 1218-1818-2418

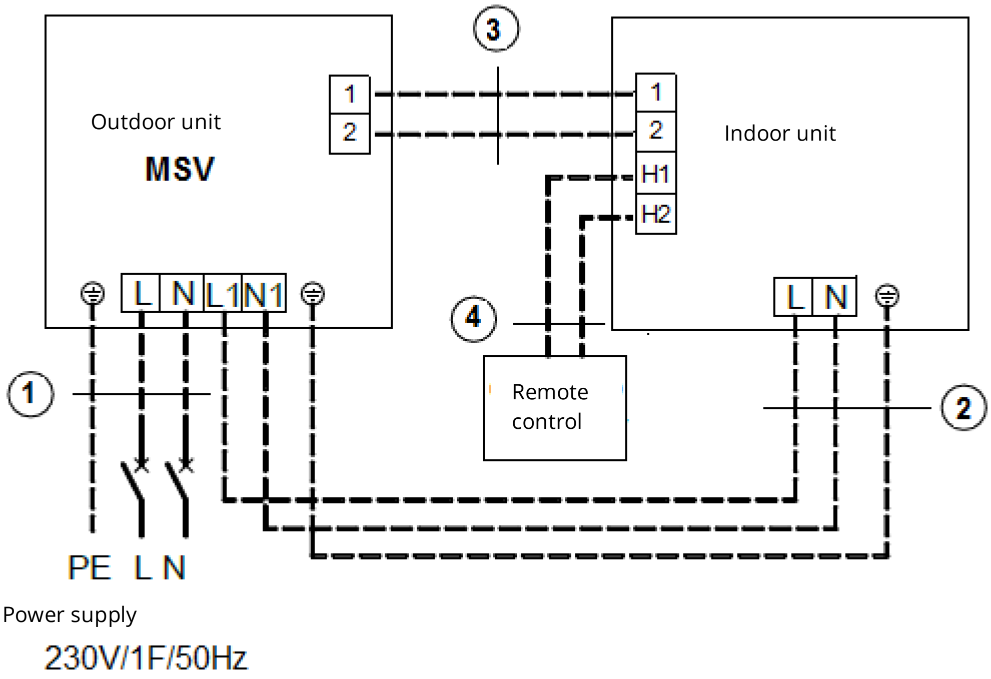

③
Outdoor unit
MSV
1
2
1
2
H1
H2
Indoor unit
L
N
L1
N1
④
L
N
①
Remote control
②
PE L N
Power supply
230V/1F/50Hz

Fig.65

Models THREE-phase 3618-4818-6018

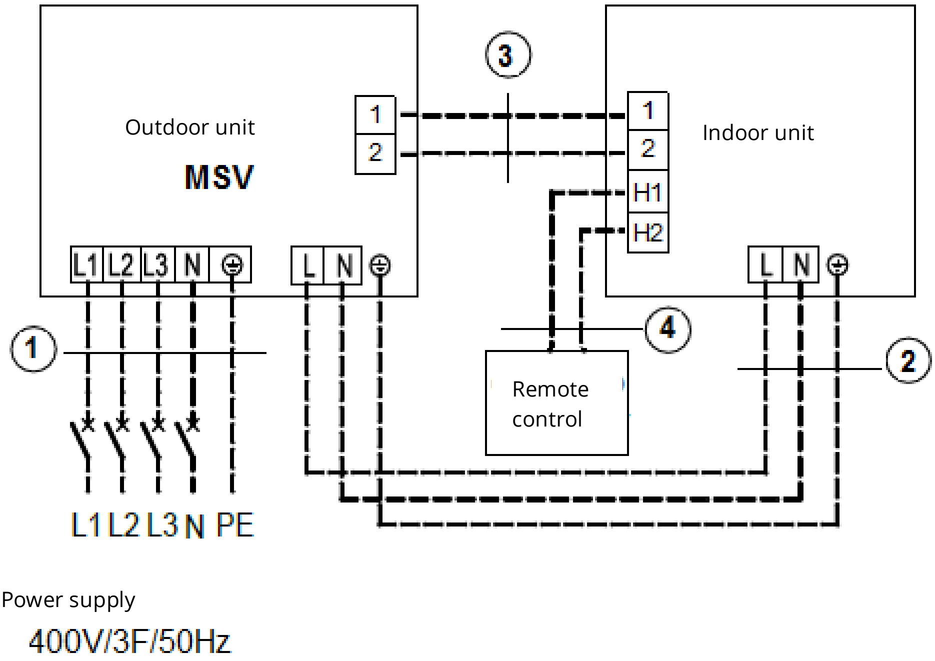
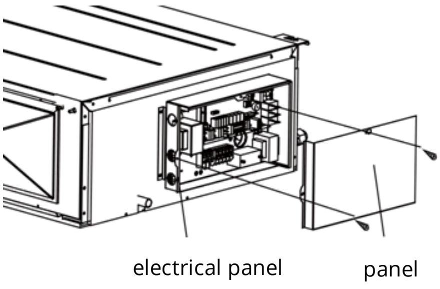

Outdoor unit
MSV
1
2
③
1
2
H1
H2
Indoor unit
L1
L2
L3
N
L
N
L
N
④
①
②
Remote control
L1 L2 L3 N PE
Power supply
400V/3F/50Hz

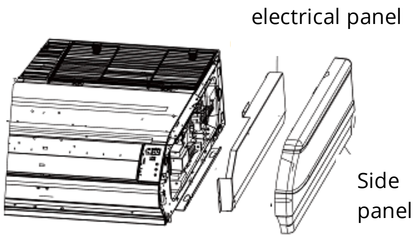
Fig.66

CONNECTION DETAIL IN INDOOR UNITS

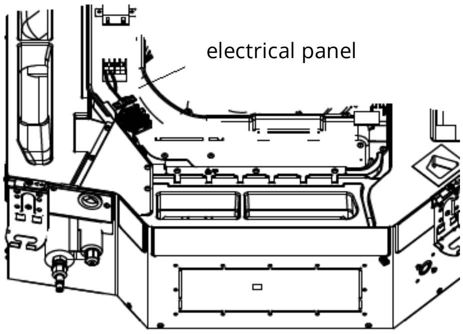
DUCT - DSV

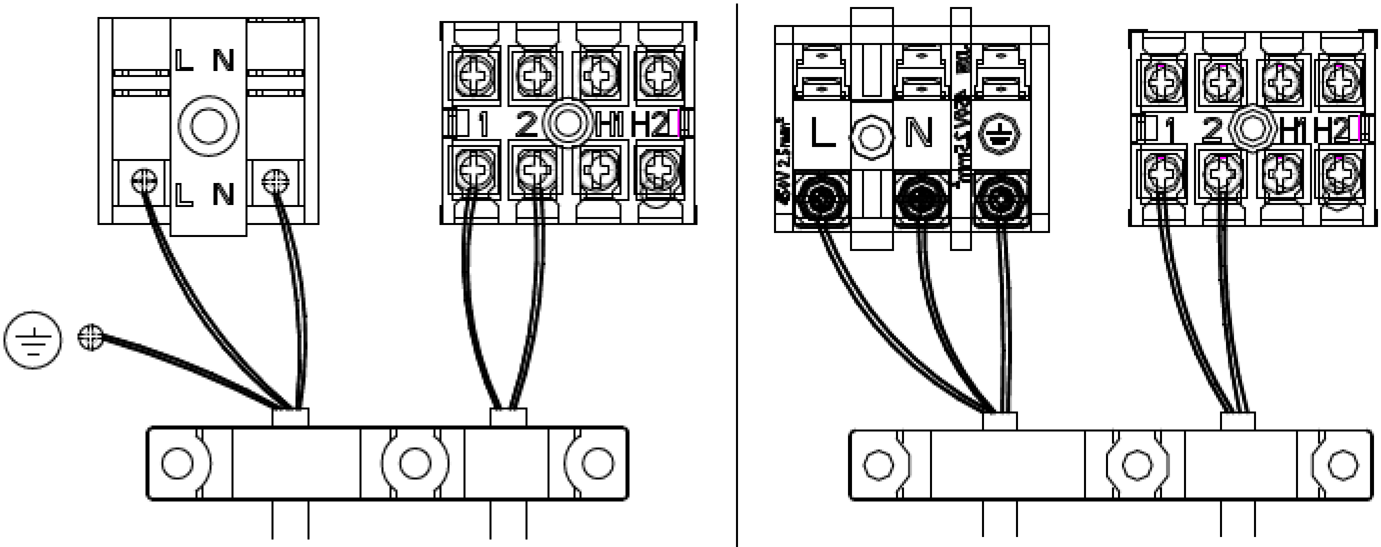

electrical panel
panel

FLOOR-CEILING - FSV


electrical panel
Side panel

CASSETTE - CSV


electrical panel


DSV Models 12-18-24-36-48

DSV60, CSV and FSV Models

L
N
1
2
H1
H2
INDOOR UNIT CONNECTION
OUTDOOR UNIT CONNECTION

Fig. 67th

WIRING DIAGRAM CONNECTION OF THE INTERNAL UNIT CASSETTE CSV TO THE CEILING GRID

CSV 1818 HE32

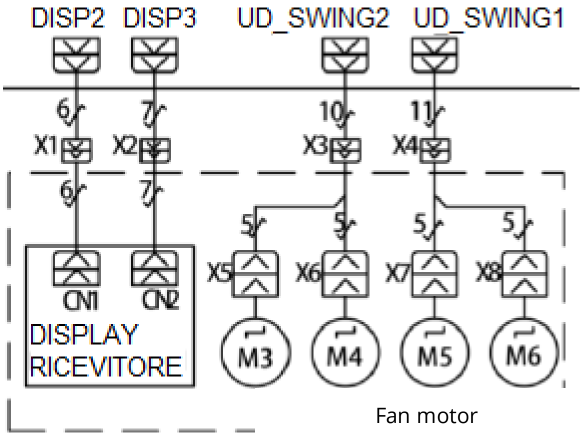

DISP2
DISP3
UD_SWING2
UD_SWING1
6
7
10
11
X1
X2
X3
X4
6
7
5
5
5
5
X5
X6
X7
X8
CN1
CN2
DISPLAY
RICEVITORE
M3
M4
M5
M6
Fan motor

Fig. 68th

CSV 2418 - 3618 - 4818 HE32

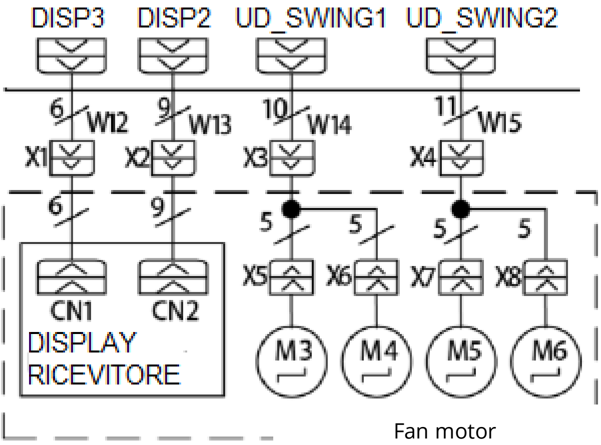

DISP3
DISP2
UD_SWING1
UD_SWING2
6
W12
9
W13
10
W14
11
W15
X1
X2
X3
X4
6
9
5
5
5
5
X5
X6
X7
X8
CN1
CN2
DISPLAY
RICEVITORE
M3
M4
M5
M6
Fan motor

Fig. 69th

CONNECTION DETAIL IN EXTERNAL DRIVES - MSV

Models SINGLE PHASE MSV 1218-1818-2418 HE32

To access the external terminal block, remove the side handle panel.

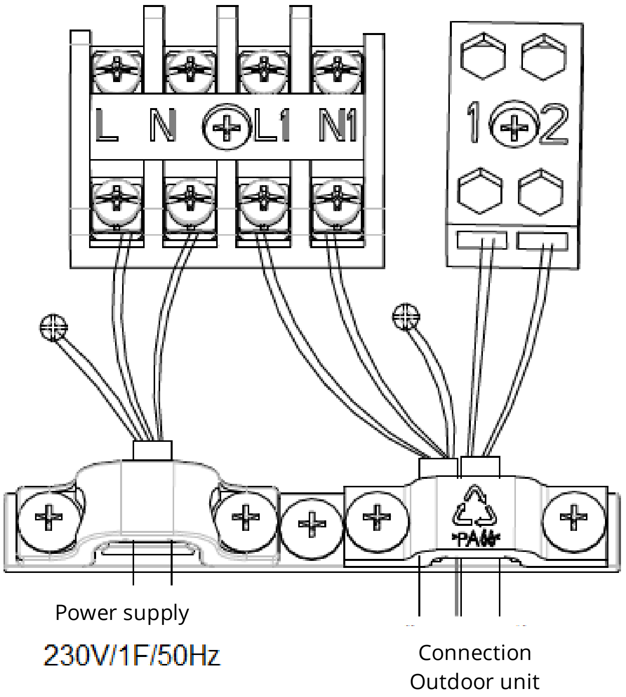
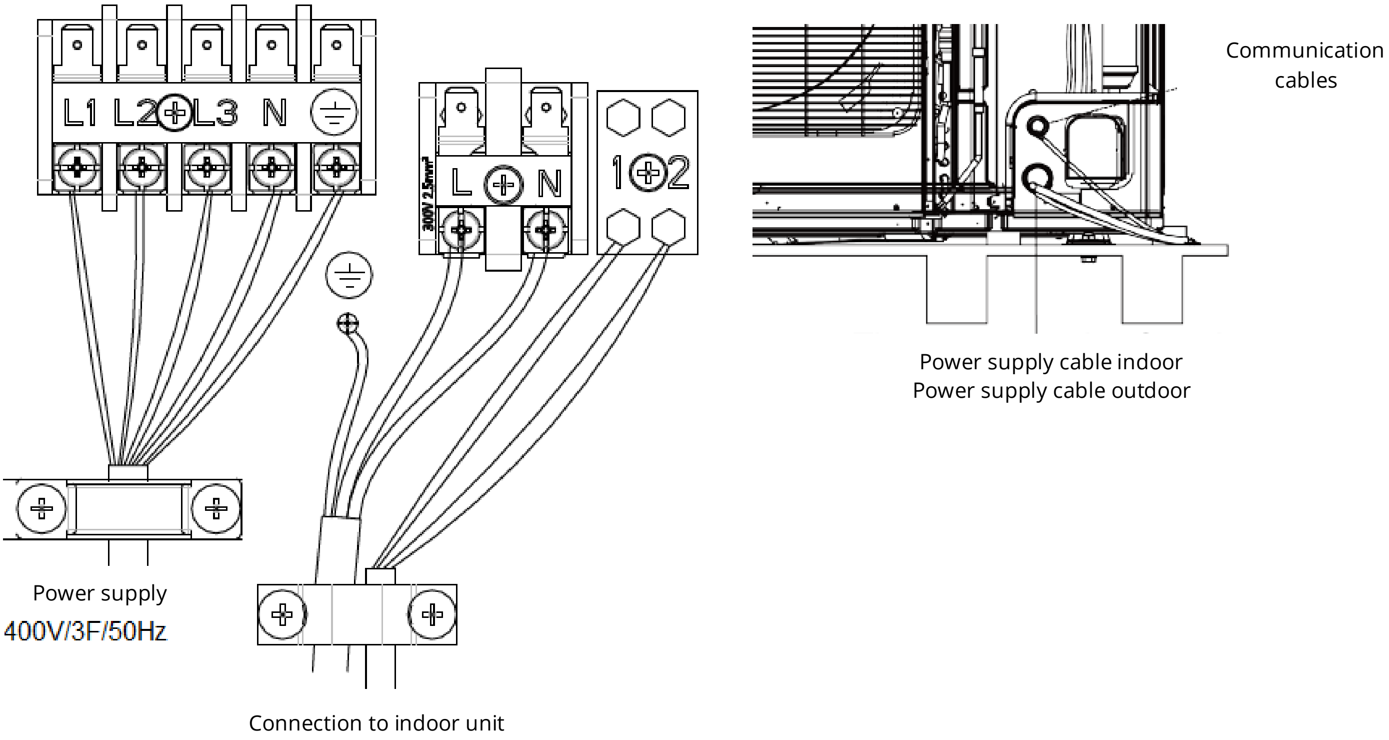

L
N
L1
N1
1
2
PA66
Power supply
230V/1F/50Hz
Connection
Outdoor unit

Fig. 70th

Models THREE-PHASE MSV 3618-4818-6018 HE32


L1
L2
L3
N
300V 2.5mm²
L
N
1
2
Communication
cables
Power supply cable indoor
Power supply cable outdoor
Power supply
400V/3F/50Hz
Connection to indoor unit

To access the external terminal block, remove the front panel .

Fig. 71st

WALL CONTROL INSTALLATION (standard for DSV ductable model)

PLACE OF INSTALLATION

For a correct operation of the wall control follow carefully the following indications:

- Avoid installing it andmove directly to the sun's rays;
- Avoid setting it upin a tent or other covered place;
- Avoid installing it towards the flow of air leaving the air conditioner;
- Avoid installing itin excessively hot or too cold places;
- Avoid installing itwhere it may be subject to electrical or magnetic interference;
- Do not cover it;
- The control must be fixed to the wall, in an easily accessible position, at a minimum height of 1.5 meters from the floor;
- The maximum distance between the indoorunit and the wall control is 30 meters (recommended distance: 8 meters);
- Maintain a minimum distance of between the wall control cable and the power line , unless the lines are protected with shielded cables and/or separated with pipe/canal20 cmina.
- The wall control must be placed on the wall using an electrical box (not provided by the company). One possible solution is the Gewiss GW24221 built-in telephone box.

COMPONENTS

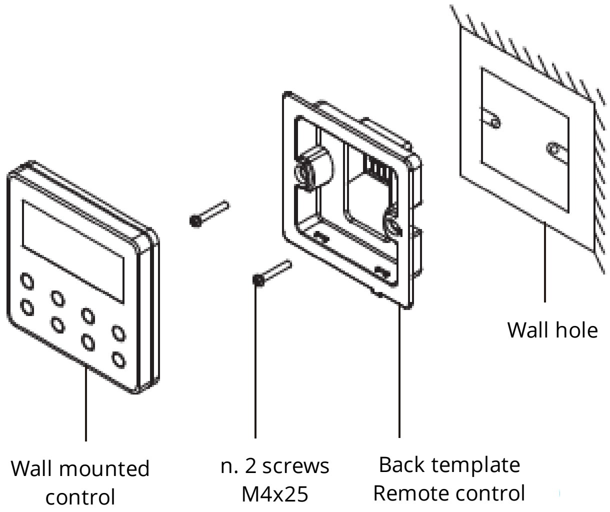


Fig.

DIMENSIONS (mm)

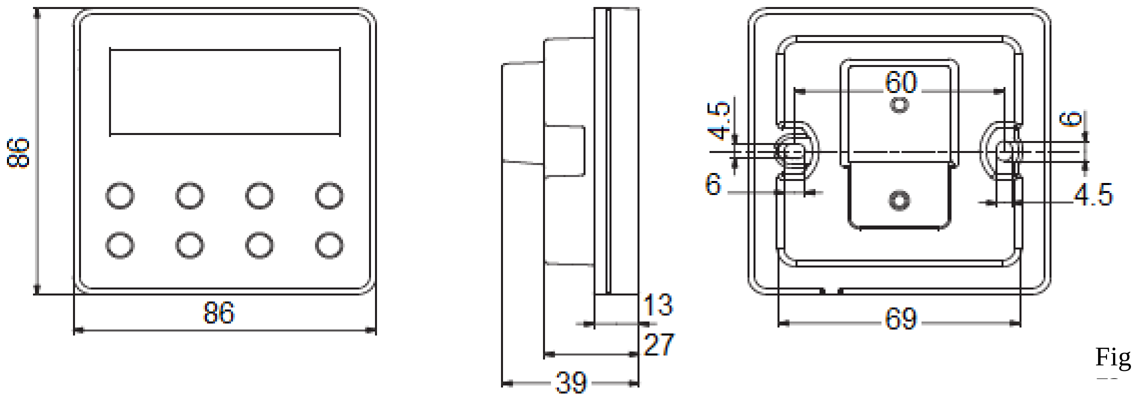


Fig.

HOW TO INSTALL THE WALL MOUNT

PRECAUZIONE

Remove the power supply from the indoor unit!

1) Unclip the frame of the wall control;
2) Remove the front panel from the wall control;
3) Mark with a pen where to drill holes in the wall based on the rear template of the command;
4) After drilling the hole on the wall, pass a cable with two wires (minimum section 0.75 mm², maximum length 30 meters) through the rear hole of the remote control template;
5) Fhoist the control on the wall using M4x25 screws and dowels;
6) Connect the cable to the terminal block H1 and H 2 respecting the connection 1 and 2 of the terminal block indoor unit;
7) Reinsert the front panel on the wall control;
8) Attach the control to the wall template.

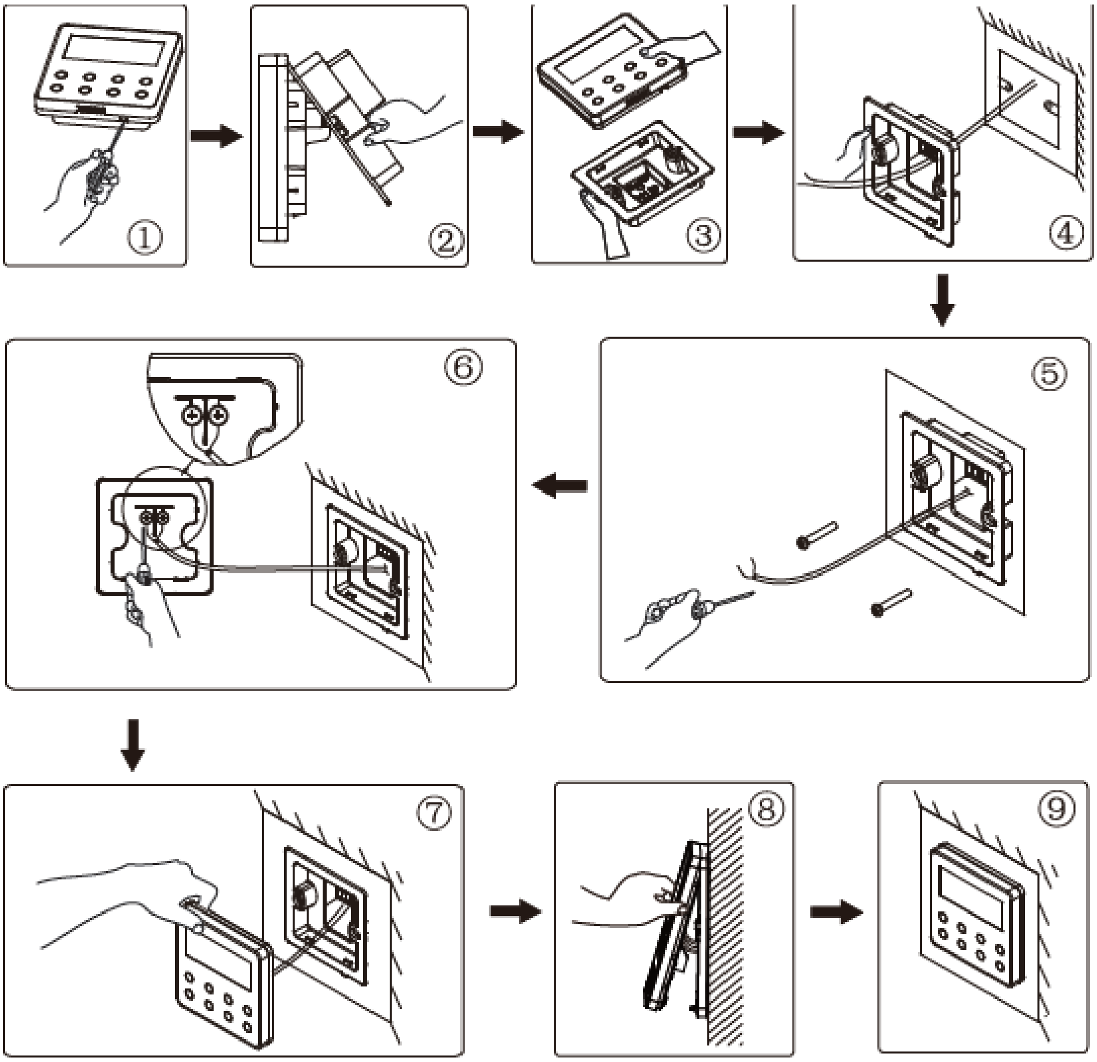


Fig. 74th

NOTE:

NOTE:

FPMP MUI 211201

ECA Technology
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